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UNIVERSITY OF TORONTO

REPORT OF THE DEAN

OF THE

FACULTY OF MEDICINE

Session 1948-1949

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Report of the Dean of the Faculty of Medicine

In the life of a university there are bound to be associations with the various seasons of the year. In the spring the workmen quickly erect the fence about that circle of greensward, which nature with such miraculous bounty manages to convert from a beaten, furrowed field to green turf in time for the first convocation. The hot June nights suggest the last efforts on the part of medical students, and the tired examiners driving themselves to do another half dozen papers.

The special convocation for medical students has, I think, become a tradition. This year it was held on June 17th. One hundred and fifty-one young doctors were added to the nation's strength and ten received the B.Sc.(Med.) degree. The Graduate School, after due consideration, allowed four young surgeons to appear before the Chancellor to receive the M.S. degree—the only graduate degree available to a medical graduate in this university, since a benevolent Senate ruled in 1928 that all who qualified for a first degree in medicine should receive the Doctor's instead of the Bachelor's degree. The degree of Doctor of Laws (*honoris causa*) was conferred on Dr. W. E. Gallie who retired two years ago as Professor of Surgery and three years ago as Dean. Dr. Gallie then addressed Convocation. A very large attendance, both in the Convocation procession and in the guest seats, a sunny day, the chimes of the carillon at Hart House, and a garden party in the quadrangle—all these things make for traditions worthy of perpetuation.

Such memories remind one that the President, who leaves for the ancient and storied fastnesses of Cape Breton soon after Convocation—it is his last of nine—must needs have the annual report. (It is realized that although this is being written late in June, it will not be in general circulation until the end of the year).

I have just completed a study of the various departmental reports. It is a salutary experience to review the work that is in progress. It is enlightening, and indeed a serious reminder of one's own responsibility. To read of the many undergraduate activities involved in a registration of 1,000 students, the list of researches in the various departments, the publications on scores of diverse subjects, the story of how the various departments reach out and influence in various fields the life of the citizen in every walk of life—all this gives one some understanding of the role and position of a medical school in the community.

I have indicated the numbers who qualified this year. We have taken 150 young men and women into the first premedical year and a further 25 have been selected to enter the first medical year. These last have fulfilled the requisites of premedical education by having obtained an Arts degree. There will be successively larger classes qualifying for the next three years. At the end of that period we shall have approximately 200, with steadily increasing obligations in postgraduate work. The task of the teachers in the clinical years will indeed be heavy. The undergraduate life has been vigorous and healthy. On the one hand there has been an increasing interest in various forms of athletics, and on the other, the undergraduate medical journal has improved in form and content, and such institutions as Daffydil, the Glee Club, and the Arts and Letters Club have enjoyed active support and produced creditable performances.

Postgraduate activities. There is a steadily increasing interest in this centre in postgraduate training. That the special courses in the autumn have had a wide appreciation is evidenced by the fact that there are this year twice as many applications as there are places available. It is, however, impossible to maintain the standard of instruction if more than 25 students are admitted to each of the divisions of medicine, surgery, obstetrics and gynaecology. For the family physician, during the year, three short courses were offered, one limited to 100 candidates

given by the staff of St. Michael's Hospital in January, one sponsored by the Alumni given in the autumn at Sunnybrook Hospital, and attended by some 300 doctors. Another three-day course stressing surgery for the general practitioner was sponsored by the Ontario Medical Association in April and the greater part of the programme was given by members of the Faculty.

A new series of weekly seminars was initiated. These have been advertised as clinical basic science conferences. Some thirteen sessions were held this year. They featured short contributions to a subject of general interest by the clinician and two or more members of the staff who had special knowledge of the basic scientific problems involved. These were primarily for the benefit of the senior house staff in the city hospitals and the junior teaching staff, but members of the profession were invited. The meetings were very well attended. The overcrowding at these sessions of the ancient lecture room in the General Hospital is a further reminder of the urgent need for new and modern lecture room accommodation.

Again we have had many visitors from abroad and the United States. Professor John Beattie delivered the Banting Memorial Lecture and Professor Waltman Walters of the Mayo Clinic the Balfour Lecture. It is hoped that arrangements may soon be made to print an annual volume of special lectures given in the medical school.

Research. A very full account of the varied research programmes will be found under the departmental reports. A word or two, however, on some of the special projects and the progress of plans for their initiation. A newly equipped laboratory for the study of steroid chemistry and its clinical application will be available for use with the beginning of the new session. Professor Gornall, who will return from Edinburgh to guide the work, is assured of initial support from the National Research Council. His tour of British centres has been made possible by a liberal grant from the Nuffield Foundation. The laboratory for the clinical use of isotopes is also nearing completion and the equipment has been procured. It is expected that work in this special field will proceed without further delay in the next session. Both these projects have been made possible by liberal grants from the Federal government.

The Rockefeller Foundation has made a grant for the furtherance of work in applied neurophysiology and encephalography. Dr. J. W. Scott who has spent the past year as a Nuffield scholar in Britain will return to begin his work in neurophysiology and to take charge of the electroencephalographic laboratory at the General Hospital.

It is interesting to note the progress in the Department of Psychiatry in the past two years under the direction of Professor Stokes. In the summer of 1948 certain Federal grants were announced in the field of mental health training. It took the greater part of the holiday months, but Dr. Stokes as chairman of an interim university committee succeeded in surmounting all obstacles which seem inevitable in newly launched government schemes. By September 20th, even although it was very late to secure new personnel, the monies were available and throughout the year great progress has been made in building an integrated scheme for modern training in psychiatry. With increased grants this year there is great hope for the future, although here again buildings are the pressing need.

This year has been marked by many gifts and bequests to the Faculty. The Medical Alumni Association has founded two additional scholarships of $200 each in the medical years. The late Helen L. Vanderveer, one of our own graduates, left $75,000 which, added to the $50,000 previously given as an anonymous donation, allows for two graduate scholarships in medicine, and one in paediatrics. Mrs. W. E. Corlett has given $10,000 to endow a scholarship in the first medical year which will be tenable for a student throughout the remainder of his or her medical course. Famous Players Canadian Corporation has given a scholarship of $500 to a student at the end of the second premedical year, awarded for high

standing in the humanities and optional subjects in those years. Charles E. Frosst & Company has endowed a $2,000 fellowship in Art as Applied to Medicine. The Canadian National Institute for the Blind has given a one year fellowship for research in ocular genetics. The Sandoz Company has established a prize of an electric ophthalmoscope in the third medical year, to be awarded on the results of the examinations in pharmacology. The Kellogg Foundation has offered two travelling fellowships of the annual value of $1,800. These will be available to candidates in an advanced stage of graduate training who will return to Canada to engage in teaching and/or research. They will be tenable only in the United States.

There is recent information that we may shortly expect to have the architects' drawings and the contracts let for a new building on College Street beside the Banting Institute. This will be known as the Charles H. Best building and will house the Department of Physiology. It will also allow for expansion of the Departments of Bacteriology and Medical Research. New and improved animal quarters will make possible the development of the work in virus diseases. By moving the Department of Physiology out of the Medical Building much needed space will be made available for the Departments of Pharmacology and Biochemistry.

New additions are presently planned at the Western Hospital and St. Michael's Hospital. The new Children's Hospital is at last assuming visible form. All these changes will greatly improve the facilities for both undergraduate and graduate work. At the General Hospital a committee of the staff has been working for the past year on recommendations for alterations and extensions. It is indeed time there for many changes. After 35 years the General Hospital is no longer a modern institution.

The Faculty in the past eighteen months has sustained particularly grievous losses by death—in January 1948, Dr. Roscoe Graham; in January 1949, Dr. Gordon Richards; in April 1949, Dr. Fred Tisdall; and now Dr. Neil McGillivray. Dr. Graham and Dr. Tisdall in their fifties and Dr. McGillivray in his thirties, were all men of vigour and vitality. What a toll of our colleagues is taken by cardiac infarction! Generations of students will remember the brilliant teaching and the skill of Roscoe Graham. Thousands of Canadians will mourn the loss of Tisdall, a nutritionist of international fame. Dr. Neil McGillivray who was the physician to the Wellesley Division of the General Hospital was surely taken even before the noonday of a great career as a teacher and physician. He will be particularly missed by those who knew him as a fellow officer in the 15th General Hospital. Dr. Gordon Richards fell a victim to leukaemia, probably induced, and certainly aggravated by his long exposure to radioactive agents. He had by his tremendous enthusiasm and great skill earned for himself and thereby for this centre, an international reputation in radiotherapy. His place will indeed be difficult to fill.

Many honours and distinctions have come to members of the Faculty during the past year. The degree of Doctor of Laws (*honoris causa*) was conferred on five members of the staff, two of whom are Professors Emeriti. Dr. W. E. Gallie was so honoured by the University of Toronto, Dr. Duncan Graham by Queen's University, Dr. William Magner and the Dean by the University of Saskatchewan, and Dr. C. H. Best by Dalhousie University.

Dr. R. I. Harris was admitted to Honorary Fellowship in the Royal College of Surgeons of England, following which he delivered a Hunterian Lecture. Dr. W. E. Gallie delivered the Trimble Lecture in Baltimore at the Sesquicentennial Celebration of the Medical and Chirurgical Faculty of the State of Maryland. Dr. P. E. Ireland represented the Canadian Otolaryngological Society at the Fourth International Congress of Otolaryngology held in London in July 1949. Dr. J. A. Sullivan was guest speaker at this Congress.

Several members of the staff of the Departments of Medicine, Surgery, Paediatrics, Obstetrics & Gynaecology, were admitted to fellowship in the Royal

College of Physicians and Surgeons of Canada. Dr. Gladys Boyd was elected a Fellow of the American College of Chest Physicians. Dr. H. W. D. McCart was elected a Fellow of the American Bronchoscopic Society and Dr. E. J. Trow was made an Honorary Member of the Section of Dermatology of the Royal Society of Medicine.

Dr. C. H. Best was made a Commander of the Order of the Crown (Belgium). He was elected President of the American Diabetes Association and awarded the Banting Memorial Medal by that Association. He was also named Honorary President of the Ontario Diabetic Association.

Dr. K. G. McKenzie was President of the Senior American Neuro-surgical Association during 1948. Professor A. C. Singleton was elected President of the Canadian Association of Radiologists and was appointed a member of the Active Consultant Staff of the Hospital for Sick Children. Miss Maria T. Wishart was appointed Vice-Chairman of the Board of Governors of the Association of Medical Illustrators. Dr. E. H. Shannon was elected a Councillor of the Radiological Society of North America. Dr. Carl Aberhart was elected to membership in the American Society of Genito-Urinary Surgeons.

I should like to acknowledge the continued support and cooperation of our Medical Alumni. The dinner this year in honour of the graduates of 1949 and those of 1899 was a great success. The speaker was Professor Spence of Newcastle-on-Tyne.

I should like also to thank the members of the Faculty for their cooperation during the past year, and particularly those who give so much of their time to the various committees. The members of the administrative staff have, as always, worked cheerfully and tirelessly. Miss Perry who has been with us so many years in the Medical Office is leaving to be married. We shall miss her greatly.

J. A. MacFarlane, *Dean*

Publications

MacFarlane, J. A. "The role of the consultant services in war time" (*Journal of the Royal Army Medical Corps*, May, 1949).

Medical Society

(September, 1948, to June, 1949)

Honorary President	Dr. J. A. MacFarlane
Honorary Secretary-Treasurer	Dr. J. C. B. Grant
President	M. L. Bunker
Vice-President	R. F. Hetherington
Treasurer	B. H. Buchanan
Secretary	A. R. K. Doyle

During the past academic year, the Medical Society has endeavoured to make its activities more profitable to the medical student body as a whole. To this end, the students have been encouraged to take an active participation in its subsidiary organizations.

The *Medical Journal* has increased the number of its staff from both pre-medical and medical years. The attendance of the faculty advisors has been encouraged. Regular meetings have been held at which class representatives may present the views and suggestions of their own groups. As a result, the make-up of the journal has been renovated. Articles pertinent to all groups have been published. To defray the increased cost of printing, circulation and advertising have been substantially increased.

The monthly meetings of the Medical Arts and Letters Club have been outstanding in both calibre and attendance. No doubt the two are related. Such prominent speakers as Professor Line, Sir Ernest MacMillan, Gregory Clark, Mr. George McCullagh and Dean MacFarlane were heard. Diversions in the form of debates and musical evenings were also sponsored.

The Medical Athletic Association has enjoyed a successful year as evidenced by the trophies on display in the Medical Building. Its endeavour has been the participation in sports of a maximum number of students.

Daffydil, the undergraduate theatrical production, was successful in pleasing both the board of censors and the student body. It is proof that musical and dramatic talent are not lacking in the medical faculty.

The Medical-at-Home was held at the Royal York Hotel, and medical students, medical staff and guests enjoyed an evening of dancing and entertainment. Plans for an even improved gathering have been formulated for the next year.

This year the University of Toronto provided the National Executive of the Canadian Association of Medical Students and Internes. The local executive was instrumental in obtaining interne appointments for the graduating students, as well as summer employment for many of the undergraduates.

A few of the many other activities of the Medical Society can only be mentioned. The Freshman reception at Hart House was held again this year, and new undergraduates were afforded the opportunity of meeting members of the medical staff and the Medical Society executive. A book committee was established to investigate the possibilities of obtaining medical texts at reduced cost. A booth was sponsored at the Red Feather Fair and garnered first award of that organization. A float was constructed for the Home-coming Week-end parade. Medical Christmas cards were purchased and distributed to the students at cost. A telephone for the use of medical students is maintained in the Medical Building. Films for the prevention of social discrimination were shown during the Intercultural Affairs week. The Medical Music Association presented an evening of music at the Toronto Conservatory of Music on behalf of the International Student Services.

The last two meetings of the year were joint meetings of the incoming and outgoing executives. Financial reports and budgets of the various subsidiary organizations were considered. The final meeting was held in the Medical Faculty Board

room with the Honorary President, Dean MacFarlane, in the chair. The Honorary Secretary-Treasurer, Professor J. C. B. Grant, was also present. At the conclusion of the meeting, the chair was turned over to the President of the incoming executive.

M. L. Bunker

Medical Athletic Association

(September, 1948, to June, 1949)

Honorary President	Dr. J. A. Sullivan
President	W. A. Cochrane
Vice-President	D. Hubbard
Secretary-Treasurer	J. McIlraith
Publicity Manager	W. MacKenzie
IV Medical Representative	H. Davies
III Medical Representative	R. Volpé
II Medical Representative	B. Halliday
I Medical Representative	K. Hobson
II Premedical Representative	K. Mustard
I Premedical Representative	P. Vernon

In September many fall sports began, with football, soccer and lacrosse predominating. The Senior Meds rugby team was eliminated in the semi-final playoff by the Mulock Cup champions, St. Michael's College. However, the Senior Meds lacrosse team for the second time in as many years won the Dafoe Cup emblematic of the Intramural lacrosse championship. On October 15th some 350 students turned out at the annual Meds Track and Field Meet to view the 1948-49 Senior Meds football team and watch the competitors and the awarding of ribbons to individual track champions. For the fourth straight year, the class of 4T9 won the individual and year championship with H. Davies being the individual champion.

During the winter Meds had strong entries in hockey and basketball. However, swimming was the Meds forte as they won the freshman swim meet, the junior and senior Interfaculty swim meets and also the Swim League championship. The majority of the members of the Swim teams were from I Premed which is perhaps one of the best athletic classes in the faculty. II Premeds, not to be outdone by the freshmen, won the Intramural volleyball championship.

In the late winter the annual Meds Athletic Dance was held at the Club Top Hat. Dr. J. Sullivan presented eleven special awards and thirty-two medical M's. The Medical Athletic Stick was awarded to the author.

The Treasurer reports a budget of $2,000, most of which was spent on equipment for the teams. Inaugurated for the first time this year was a standard award which is to be presented to each member of a championship interfaculty team. The award consists of a pair of book-ends bearing the Medical Athletic crest in bronze and a suitable inscription.

Over twenty men entered intercollegiate competition and in interfaculty team sports 381 Meds men were organized into thirty-one teams, second only to University College in the number of participants. However, in tournament type sports such as golf, tennis, track, etc. the number of Meds participants was only ninety-four. This year Medicine finished fourth for the T. A. Reed Trophy which was won by St. Michael's College.

Medicine has again completed a good year in athletics with no less than six Intramural championships. It is hoped that next year, with an increased budget, more and newer equipment and greater participation by students in tournament sports, the T. A. Reed Trophy will again find a place in the Medical Office.

W. A. Cochrane

Medical Women's Undergraduate Association

(September, 1948, to June, 1949)

Honorary President	Dr. Ellen Blatchford
President	Miss L. A. Lloyd
Vice-President	Miss D. M. Stillwell
Treasurer	Miss E. F. Line
Secretary	Miss A. N. Crocker
Social Convener	Miss E. J. McCree
1st Premedical Representative	Miss H. I. Davies

During the year 1948-49, the M.W.U.A. held regular monthly meetings at which plans were made for the various activities of the women.

Letters to the women of the freshman class arranged for each "Freshie" to meet a senior on registration day. Following a tour of the campus, during which the freshies registered in their courses, a luncheon was held at the Alexandra Palace, at which the President formally welcomed the freshies and told them about activities of the M.W.U.A.

A weiner roast was held October 6th, at which all old and new members of the M.W.U.A. became acquainted.

The Annual Banquet was held October 12th. According to tradition the freshies were formally initiated by the President, and then by registering their acceptance of the Oath of Hippocrates. All women in medicine were present, as were the Honorary President, Dean MacFarlane, guest speaker, and some ten graduate members.

A very generous donation of Christmas toys was collected by the medical women for the University Settlement children. Several members of the M.W.U.A. assisted at the party given the Settlement children by Dean Ferguson of University College. The medical women supervised games in the Lillian Massey gymnasium, and helped to serve supper to some seventy Settlement children.

A committee of medical women submitted a detailed report for the Food Committee of the Student Memorial Building, sponsored by the Students' Administrative Council.

The M.W.U.A. sponsored a January Theatre Night at Hart House for George Bernard Shaw's "The Doctor's Dilemma." A block of tickets was obtained for the use of medical women.

Two discussion meetings in the form of open forums were held in February and March. The first discussed the value of occupational therapy in the treatment and rehabilitation of the patient. It was ably led by Miss M. Hood, Chief Occupational Therapist of the Workmen's Compensation Clinic at Malton. The second was a panel discussion on Interneship, including also positions available for students in their medical years and following a general rotating interneship. General practitioners and specialists in many fields of medicine very kindly attended the discussion, and offered valuable advice. Dr. Jean Davey chaired the meeting.

The final meeting of the year was also in honour of the graduating women. The vice-president, on behalf of the third medical year, presented a leather wallet to each graduate.

Arrangements have been made whereby the University will paint the walls and ceiling of the women's common room in the medical building, as well as varnish the floor and repair the couches and upholster the furniture, providing the M.W.U.A. obtains the upholstering material. The M.W.U.A. wishes to thank the Medical Society for granting an additional sum of $60.00 to pay for this material. The work is to be done during the summer. The M.W.U.A. has also bought a comfortable chair for the common room and arranged to have the curtains cleaned.

The M.W.U.A. Constitution as revised in 1947-48 was ratified and finally passed.

During the year, the M.W.U.A. was represented by the President on the Medical Society and the S.A.C., and thus kept in contact with the activities of the various colleges and faculties of the University.

LOIS A. LLOYD

Medical Women's Athletic Association

(September, 1948, to June, 1949)

President	Miss E. M. Heakes
Vice-President	Miss S. B. Eastwood
Secretary	Miss J. E. Fletcher
Treasurer	Miss R. E. Alison

Medical women entered six interfaculty sports during the year 1948-49. The teams in the four major sports—baseball, basketball, hockey and volleyball—each won their league, only to be defeated by a very close margin in the semi-finals. A combined team from the School of Nursing and the medical women undergraduates placed second to Physical and Health Education in the interfaculty synchronized swimming. Four women entered the tennis tournament but were defeated. Although badminton was played by several of the students, no one entered the interfaculty tournament.

The annual banquet of the Association was held at the Diet Kitchen. Dr. Wallace Graham was the guest speaker and at the conclusion of the dinner a movie of the semi-final Varsity-Western football game was shown. There were forty present at the banquet and the following awards were made: one Premedical Bar; five Medical M's; five Junior T's; one Third Colour; and one Intercollegiate Shield for hockey.

E. M. HEAKES

FELLOWSHIPS, SCHOLARSHIPS, MEDALS AND PRIZES

Awarded at Convocation, June 1949

GRADUATE

The Francis Esther Hutchison Fellowship	P. O'Sullivan, M.D.
The Lister Prize in Surgery Aeq.	W. G. Bigelow, B.A., M.D., F.R.C.S.(C) W. T. Mustard, M.D., F.R.C.S.(C)
The Percy Hermant Fellowships in Ophthalmology	D. Black, M.D. R. W. Robertson, M.D. C. Baird, M.D., C.M.
The Canadian National Institute for the Blind Fellowship in Ophthalmology	L. A. Probert, B.A., M.D.
The E. P. Taylor Fellowship in Oto-Laryngology	E. J. Stark, M.D.
The George Brown Memorial Scholarship in Medical Science	R. D. Prueter, M.D.
The J. J. Mackenzie Fellowship in Pathology and Bacteriology	J. S. Crawford, M.D.

FOURTH MEDICAL YEAR

The Cody Gold Medal	M. G. Wolfish
The Cody Silver Medal	C. Ezrin
The Cody Silver Medal	F. G. Pearson
The Chappell Prize in Clinical Medicine	C. Ezrin
The Chappell Prize in Clinical Surgery	M. G. Wolfish
The Ellen Mickle Fellowship	M. G. Wolfish
The David Dunlap Memorial Scholarship	C. Ezrin
The William John Hendry Memorial Scholarship in Obstetrics and Gynaecology	F. G. Pearson

The Ontario Medical Association Prize in Preventive Medicine	F. G. Pearson
The Doctor Roy Simpson Scholarship in Paediatrics	C. Ezrin
The Class of 1924 War Service Scholarship	J. W. Ridge

THIRD MEDICAL YEAR

The Ronald S. Saddington Medal in Pathology	R. F. Hetherington
The John Copp Bursary	R. A. Haliburton

SECOND MEDICAL YEAR

The David Dunlap Memorial Scholarship	Miss S. M. Ramcharan
The Posluns Brothers Scholarship	Miss S. M. Ramcharan

SECOND PREMEDICAL YEAR

The Alec Garalick Scholarship	F. B. Fallis

REGISTRATION OF STUDENTS IN THE FACULTY OF MEDICINE

SESSION 1949-1950

First premedical year	149
Second premedical year	146
First medical year	166
Second medical year	171
Third medical year	177
Fourth medical year	159
Art as Applied to Medicine	10
Bachelor of Science in Medicine	4
Diploma in Psychiatry	9
Diploma in Radiology	4
Diploma in Public Health	26
Diploma in Industrial Hygiene	1
Graduate Students	80
	1,102
Advanced Graduate Course (Medicine, Surgery, Obstetrics and Gynaecology)	74

Anatomy

Under the direction of Professor J. C. B. Grant

During the year that has just passed the revised curriculum came into effect as regards Anatomy and the Second Year Medical Students, in that for the first time they received no instruction from the staff of this Department. Accordingly, the staff was free to spend more time with the First Year Students at the beginning of the Session, when they have most need of guidance.

The giving of instruction in Anatomy to the Postgraduate Class on Obstetrics and Gynaecology was assumed as a new responsibility.

Last year, 1217 undergraduate and graduate students worked in the Department; this year the number had fallen to 942. They were distributed amongst the various courses as follows:

UNDERGRADUATE COURSES IN GROSS ANATOMY:

1. Medical, first year	192
Art as Applied to Medicine	4
Physical Therapy, teachers' course	1
2. Dental, first year	82
3. Physical Therapy, first year	16
4. Physical Therapy, second year	22
5. Occupational Therapy, first year	35
6. Occupational Therapy, second year	55
7. Physical and Health Education, second year	86
8. Physical and Health Education, third year	94
9. Optometry	97

GRADUATE COURSES IN GROSS ANATOMY:

10. M.S. and F.R.C.S. Courses	51
11. Ophthalmology	14
12. Oto-Laryngology	9
13. Dental Specialties	7
14. Demonstrators of Anatomy to medical students	5
15. Demonstrators of Anatomy to dental students	4
16. Postgraduate Course, Medicine	24
17. Postgraduate Course, Surgery	26
18. Postgraduate Course, Obstetrics and Gynaecology	21
19. Graduate Nurses	24

UNDERGRADUATE COURSES IN HISTOLOGY:

20. Medical, first year	192
Art as Applied to Medicine	4
21. Dental, first year (lectures given in Anatomy Building, laboratory in Dental Building)	82
22. Physical and Health Education, second year	86
23. Physiology and Biochemistry, second year	37
24. Physiology and Biochemistry, third year	30

GRADUATE COURSE IN HISTOLOGY:

25. Dental Specialties	6

Professor H. A. Cates was recently appointed to the Directorship of the School of Physical and Health Education in succession to Doctor Stanley Ryerson. It is recognized on all sides that Professor Cates is eminently fitted and qualified to direct the School, and everyone will wish him well in the new responsible part he is to play. Professor Cates came to the University as part-time demonstrator in 1918. By 1923 he was senior demonstrator. In 1925 he joined the staff as Assistant Professor, subsequently became Associate Professor, and later full Professor. So, this year sees him complete thirty-one years' service in the Department, where all he has done has been done willingly, with enthusiasm, with energy, and acceptably. He is, however, not completely severing his connections with the Department for he will continue to give certain lecture courses.

Dr. Sylvia Bensley, of the Department of Anatomy of the University of Chicago, who, as Assistant Professor, spent six months with us last year, joined the staff as Associate Professor of Anatomy.

RESEARCH

Under the direction of Professor S. H. Bensley

Dr. J. K. B. Smith, of the Department of Oto-Laryngology, has studied various factors involved in new bone formation at the site of defects made in the parietal bones of rats. Dr. S. D. Gordon and Dr. Bensley collaborated in a histochemical study of skin grafts. Dr. Bensley collaborated with Dr. L. B. Jaques of Saskatoon, Saskatchewan, in the study of changes in the connective tissues and mast cells following betatron irradiation in the dog. Dr. Bensley continued her studies of mast cells in relation to changes in the intercellular substances of connective tissue.

Under the direction of Professor A. W. Ham

The investigation of tumours by cultivating them in chick embryos has been continued and Dr. M. I. Armstrong has succeeded in growing rat liver tumours, as well as mouse mammary tumours, in this medium. Biological materials obtained by this means have been provided for electron microscopy in the Department of Physics and for enzyme studies in the Department of Biochemistry. Dr. Marjorie M. Mosbaugh has investigated the origin of blood cells in the developing marrow spaces in callus of a recently fractured bone.

Under the direction of Professor J. C. B. Grant

Dr. J. W. Hazlett has continued the investigations started last year on the broncho-pulmonary segments and the tracheo-bronchial tree. He has also collected data on the incidence of abnormal superficial ulnar arteries. Dr. G. T. Ho, using plastics, has made casts of the labyrinth of the ear. Dr. W. M. Paul has continued the detailed investigation started last year on the various forms and connections of the pancreatic ducts. Dr. T. Y. Chang has investigated the frequency with which the synovial sheath of the peronei at the ankle is continuous with the sheath of the peroneus longus in the sole of the foot.

Under the direction of Professor C. G. Smith

Dr. C. G. Smith has entered upon a study of the significance and structure of the glomus chorioideum of the lateral ventricle. He has also been studying the variations in the human pineal gland and their possible correlation with age.

PUBLICATIONS

CATES, H. A. *Primary anatomy.* Baltimore: Williams & Wilkins. 1948.
GRANT, J. C. B. *A method of anatomy* (fourth edition). Baltimore: Williams & Wilkins. 1948.
HAM, A. W. and HARRIS, W. R. "Histological technique for the study of bone and some notes on the staining of cartilage"; in McClung's *Histological technic* (third edition). New York: Hoeber. 1949.
MACDONALD, R. K. "Effects of testicular extract on certain ocular structures" (*American Journal of Ophthalmology,* vol. 12, no. 6, 1949).

Art as Applied to Medicine

Under the direction of Miss Maria T. Wishart

It is a delight to acknowledge the establishment this year of the Charles E. Frosst & Co. fellowship in Medical Illustration, given to promote the education of competent medical illustrators in Canada. Dr. MacFarlane's interest in bringing this matter about is much appreciated.

The illustration work and teaching continues under definite physical handicaps. We have outgrown our departmental quarters completely. The fact that the students must frequently be accommodated in our already overcrowded room, due to the intense cold which prevails at times in their classroom, adds to the confusion.

The Head of the Department attended a meeting of the Association of Medical Illustrators in Chicago in October, at which time she was appointed Vice Chairman of the Board of Governors.

Miss Helen MacArthur, who graduated in June 1948, received an appointment as medical artist to the Royal Victoria Hospital, Montreal.

Miss Wishart was given an appointment as Consultant in Medical Illustration to the Department of Veterans Affairs.

Miss Wishart and Miss Blackstock arranged a small exhibition of illustrations and motion pictures, which were shown at the Toronto General Hospital jointly with some of the photographic work of Mr. Croydon, hospital photographer.

In April Miss Wishart was asked to address the University Women's Club, on the subject of Medical Illustration.

The work this year has been concentrated, following a routine pattern of making illustrations for lectures, articles and records. It has been unusual only insofar as there is little of an interesting nature to report, most of the illustrations being further contributions to work already undertaken.

PUBLICATIONS

WISHART, M. T. Review, *Graphics,* no. 3, 1949, p. 53, *Journal of the Association of Medical Illustrators.*

Biochemistry

Under the direction of Professor H. Wasteneys

I have the honour to submit my report on the department of biochemistry for the year 1948-49.

The only change in the academic staff of the department during the year has been the promotion of Dr. J. Manery Fisher from Lecturer to an Assistant Professorship. Responsibility for instruction has been distributed among the staff as follows:

Medical students, Professor Wasteneys
Advanced Biochemistry Arts students, Professors Butler and Wynne
Advanced Laboratory Course, Professor Butler
Elementary Biochemistry Arts, Professor Wynne
Elementary Laboratory Course Arts, Professor Fisher
Zymology Course, Professor Wynne
Biochemistry for Dental Students, Professor Butler
Biochemistry for Household Economics students, Professor Crocker
The Laboratory Course for Medical Students was supervised by Professor Fisher.

It has been only just possible to accommodate all the students taking laboratory courses, but with an anticipated reduction in the number of dental students the pressure on space should be relieved next year.

Two students of the department were granted the Ph.D. degree during the year, Messrs. A. M. Moore and D. L. Laughland; four students obtained the M.A. degree, Mr. J. S. Barlow, Miss J. B. Boylen, Miss H. M. McConkey and Mrs. E. R. Solkin; Dr. R. J. Slater received the B.Sc.Med. degree.

Generous grants from the National Cancer Institute of Canada, The Banting Research Foundation, The National Research Council, The Foster Bequest and the University's Advisory Committee on Scientific Research have again facilitated our research programme, the results of which are described in a separate report.

I should like to record my appreciation of the exceptional efficiency with which each member of our technical staff has performed his or her duties.

The total number of students registered in the department during the session was 555. This number was made up of 183 medical students, 22 students of the General Course, 44 in the Physiology and Biochemistry Course, 18 in Biology, 1 in the Pass Course, 12 in Food Chemistry, 50 in Household Economics, 2 in Household Science, 169 in Dentistry, 1 occasional student and 53 graduate students. Of the graduate students 25 were candidates for the Ph.D. degree, 19 for the M.A., 1 for the B.Sc.Med. and 8 were occasional students or graduate students not proceeding to a degree. Fourteen of these students were candidates for the M.A. in Biochemistry, 8 for the Ph.D. and 1 for the B.Sc.Med. degree.

Research

Under the direction of Professor A. M. Wynne

Mr. A. W. Jackson completed his study of bacterial amylases. Mr. D. H. Laughland completed his work on carotene and vitamin A.

Miss J. B. Boylen completed her investigation of the plasma phosphatase of rats in relation to tumour growth and alloxan diabetes. She initiated a study of the transaminase activity of animal tissues in relation to the growth of tumours. This study is being continued by Miss M. S. DeWolfe who was previously engaged in a study of factors affecting the activity of lysine decarboxylase.

Mr. W. L. Holmes' investigations during the past year have been concerned with three main problems. He has made further examinations of the effect of mouse mammary carcinomata, serially transferred in fertile eggs, on the cytochrome oxidase of the developing chick embryo. He investigated the oxidation of ascorbic acid, of hydroquinone and of succinic acid by the cytochrome system and has studied

critically the mode of action of substituted semicarbazides on the oxidation of hydroquinone by this system. He is also engaged in a long-term study of the stability of cytochrome c *in vitro,* and has shown that calculations of the concentration of cytochrome based on spectrophotometric analyses do not necessarily provide a true estimate of catalytic activity.

Dr. H. B. Stewart has nearly completed his study of the mechanism of the decarboxylation of amino acids by chloramine-T. He has prepared several substituted derivatives of amino acid esters and has studied the stability of the products formed by condensation of these compounds with chloramine-T. By using a suitably modified amino acid it was possible to obtain a stable condensation product which can be regarded as being analogous to the intermediary reaction product formed in the unhindered decarboxylation reaction. On the basis of these studies a satisfactory theory of the mechanism of the decarboxylation of amino acids by chloramine-T can now be proposed.

Dr. C. G. Stewart has devised a method for stabilizing pyruvate, lactate and glucose in blood samples over a period of seven days. He has made a preliminary investigation of the pyruvate, lactate and glucose in the blood of normal human subjects and of patients suffering from malignant neoplasia, following the ingestion of large amounts of glucose. The results obtained so far indicate that the glucose tolerance curve is abnormally high in cancer patients and tends to fall towards normal levels more quickly than in diabetic patients exhibiting similarly high maxima. With progression of the malignant process there would appear to be a corresponding increase in the levels of pyruvate in the blood.

Mr. J. D. O'Reilly has continued his work on the degradation of glucosamine by *Escherichia coli.* All attempts to obtain a cell-free enzyme preparation capable of catalyzing the degradation of glucosamine have been unsuccessful. It would seem that the process of degradation is dependent upon the integrity of the living and actively metabolizing organisms. Cultural variations of different types have been studied in relation to the ability of the organism to utilize glucosamine.

Under the direction of Professor G. C. Butler

Dr. J. A. Little has isolated and analysed the oligonucleotide obtained from thymus nucleic acid by the action of thymonucleodepolymerase; it appears to be a statistical tetranucleotide. A study of the hydrolysis of this oligonucleotide by means of a crude intestinal enzyme preparation has shown the conditions necessary to give a high yield of mononucleotides.

Mr. A. M. Moore, from a theoretical consideration of the action of a metabolite in reversing competitive inhibition, was led to the conclusion that the reversal of inhibition should be one of two detectably different types depending on whether the metabolite is the substrate or the product of the inhibited reaction. The application of the theory to studies of the inhibition of growth of flax seedlings by sulphanilamide and by thiouracil demonstrated its value in discovering conversions in folic acid metabolism and pyrimidine metabolism.

Mr. D. B. Smith has continued his studies of alterations in the viscosity of aqueous solutions of sodium thymonucleate. A number of different inorganic salts were tested for their effects on such solutions and it was found that trivalent cations had a precipitating action on the nucleate. The photodecomposition of hydrogen peroxide in sodium thymonucleate solutions reduced the viscosity of such solutions in a manner similar to X- and ϒ-rays. In co-operation with the Defence Research Board, measurements were made of the size and shape of sodium thymonucleate particles in aqueous solutions, and in co-operation with the Department of Physics, electron microscope pictures have been made of these particles in dried films.

Under the direction of Professor B. F. Crocker

Mr. J. L. Koppel and Mr. C. J. Porter have been continuing their investigation of the formation of enzymes within a living cell. A suspension of Micrococcus

lysodeikticus organisms is used as the experimental material. Since these cells can be completely lysed by means of lysozyme, a homogeneous enzyme suspension can be obtained and therefore kinetic studies can be readily carried out. A standard control curve relating cell concentration and fumarase activity of the enzyme suspension has been obtained. The possibility of stimulating the fumarase activity of the cell by the presence in the medium of fumaric acid has been investigated and it has been found that, whereas a lysed cell preparation exhibits marked fumarase activity, a suspension of intact cells shows practically none. It would appear that fumaric acid is unable to penetrate the cell. However, succinic acid can do so, and since the succinoxidase of the cell would convert this to fumaric acid, it might be expected that the addition of succinic acid to the medium would result in stimulation of the fumarase activity of the cell. Preliminary experiments indicate that this is so.

Under the direction of Professor J. Manery Fisher

Mr. J. S. Barlow is continuing his study of the electrolyte pattern and permeability of growing cells. He has obtained good evidence that all of the chloride of breast muscles of three-day chicks is confined to the extracellular phase. This permits a calculation of the potassium concentration inside the muscle fibre; it was found to be the same in the young muscle as in adult muscle. The concentration of intracellular sodium is under investigation. The techniques developed for muscle are being applied to other chick tissues.

A research on the relation of electrolytes to carbohydrate metabolism in frog muscle has been initiated. As an essential preliminary, seasonal variations in salt and water concentrations were followed. Miss M. Taylor has modified the Clarke-Collip calcium method in order to increase its accuracy and sensitivity, and has applied it to frog muscle and plasma. The muscle calcium concentration remained reasonably constant throughout the year at about 8 mg. per cent, while plasma calcium decreased slightly in the spring. At the same time both the plasma and muscle chloride decreased in concentration. These results imply that, in the spring, the extracellular volume of muscle was reduced to about half of that found in the winter months and that the muscle fibres themselves had considerably increased in volume.

Professor Fisher, with the assistance of Miss Jean Murphy, has begun a study of the sodium and potassium changes in frog muscle and plasma during the year. The investigation of seasonal changes is still incomplete, but she was unable to find the high intracellular sodium in frog muscle which has been reported previously. The research on leucocytes has been continued. It seems to be established now that leucocytes in a glucose-free Ringer's solution contain less potassium than those in Ringer's solution containing glucose.

PUBLICATIONS

BARLOW, J. S., SLINGER, S. J. and ZIMMER, R. P. "Reaction of growing chicks to diets varying in sodium chloride content" (*Poultry Science,* vol. 27, no. 5, 1948, pp. 542-52).

LAIDLAW, J. C. and YOUNG, L. "Studies on the synthesis of ethereal sulphates *in vivo*" (*Biochemical Journal,* vol. 42, no. 4, 1948, p. 1).

YOUNG, L., "The metabolic conversion of naphthalene to 1:2 dihydronaphthalene-1:2 diol" (*Biochemical Journal,* vol. 41, 1947, pp. 417-22).

———"A micropipette suitable for the cutaneous application of vesicants" (*Canadian Journal of Research,* vol. E25, 1947, pp. 137-40).

YOUNG, L., EDSON, M. and MCCARTER, J. A. "The measurements of radioactive sulphur (^{35}S) in biological material" (*Biochemical Journal,* vol. 44, no. 2, 1949).

Hygiene and Preventive Medicine

Under the direction of Professor D. T. Fraser

This is the first year in which graduating students have completed the new curriculum inaugurated in 1944-45. Thus the graduating class is the first to have had instruction in Hygiene and Preventive Medicine throughout four years. The staff of the Department is encouraged in the feeling that the class has evidenced a

greater interest and appreciation of the subject. Changes have been made in the teaching of the fourth medical year, placing more emphasis on the social and economic aspects of the subject. It seems very desirable that additional opportunities should be available for students to visit the homes of patients in order to appreciate to a greater degree this aspect of preventive medicine.

It is a pleasure to report the successful issue of the experiment of offering a summer interneship to a member of the third medical year. Mr. A. Rappoport was attached to East York-Leaside Health Unit for the months of July and August and during his time of study he conducted a survey on tuberculosis and submitted a creditable report. The plan of summer interneships has been enlarged this year to the extent that four students will be attached for a period of three months to municipal and county health units throughout the province. An opportunity is thus afforded not only for observing but participating in the activities of both rural and urban units. The scheme is financed by a grant from the Department of National Health and Welfare through the Ontario Department of Health. The enthusiastic co-operation of the directors of the units concerned is deeply appreciated.

The enrolment of physicians for the Diploma in Public Health for the session 1948-49 was twenty-two. In other courses four students were registered for the Diploma in Dental Public Health and five students for the Diploma in Veterinary Public Health. Five students, one of whom was from India, proceeding to the Master of Applied Science degree, were given a special course in Microbiology. Of the students proceeding to the Diploma in Public Health, eleven were from Ontario, one from New Brunswick, one from British Columbia, one from Alberta, one from Newfoundland on fellowship of the Rockefeller Foundation, four from China, one from Ceylon, and one from England. As in previous years, courses of instruction in Bacteriology, Immunology, Parasitology, and Virus Infections were given to these students, and also to suitably qualified graduate students.

Laboratory courses and lectures were given as usual to the students in the second year Pharmacy, second and third-year Household Science and Household Economics, third-year Physiology and Biochemistry, third-year Physical and Health Education and to students in the School of Nursing.

The total enrolment of students receiving instruction in the Department continues at a high level, 1177. The numbers are more than double those of 1945. The enrolment for the session has been as follows:

Candidates for the Diploma in Public Health	22
Candidates for the Diploma in Dental Public Health	4
Candidates for the Diploma in Veterinary Public Health	5
Candidates for the Degree of Master of Applied Science	5
Candidates for the Certificate in Public Health	4
Students registered in the School of Graduate Studies	6

Faculty of Medicine, Fourth Year	157
Third Year	169
Second Year	157
First Year	191
Faculty of Arts, Household Economics, Second and Third Years	86
Physiology and Biochemistry, Third Year	30
Faculty of Household Science, Second and Third Year	5
School of Physical and Health Education, Third Year	94
School of Nursing	92
Ontario College of Pharmacy, Second Year	150

Research

Reported by Professor D. T. Fraser

Dr. M. H. Brown has explored certain problems in connection with the production of B.C.G. vaccine. A standard method has been evolved for the routine production of the vaccine. In order to preserve the potency of the vaccine, methods of drying have been explored. A stable dried vaccine would make possible the carrying out of innocuity and other tests before its distribution.

The work on antibiotic substances with special reference to the tubercle bacillus and gram-negative cocci has been continued by Dr. Frieda Fraser and Miss E. Naylor. The effectiveness of a number of new preparations of penicillin has been explored in laboratory animals. In co-operation with the Women's College Hospital several of these have been used clinically.

Dr. F. O. Wishart is continuing his studies of recall doses of diphtheria and tetanus toxoids in relation to long-term antitoxic immunity in school-children and medical students. The nasal route for recall doses of tetanus toxoid is also being investigated.

Dr. R. J. Wilson is continuing his studies on the growth requirements of H. pertussis, with an ultimate aim of developing a synthetic medium.

Miss S. Toshach is investigating the problem of bacteriophage in relation to diphtheria bacilli and Miss E. I. Whittaker is undertaking a similar project in relation to acid-fast micro-organisms.

In the sub-department of Parasitology, under Dr. A. M. Fallis, Dr. Kuitunen, in co-operation with Dr. M. Brown of Queen's University, has examined material from the Arctic, both from Eskimos and animals, to determine the incidence of trichinosis and other parasitic infections. She has established the usefulness of hamsters and rabbits as experimental animals in these studies. The duration of a positive precipitin test for trichinosis is being investigated in laboratory animals. It was found that polar bears were infected in their natural habitat with *Trichinella spiralis*. The work on trichinosis is being extended over a wider area in the Arctic.

Publications

Brown, M., Cronk, B., deSinner, F., Green, J. E., Gibbons, J. E. and Kuitunen-Ekbaum, E. "A note on trichinosis in animals of the Canadian Northwest Territories" (*Canadian Journal of Public Health,* vol. 40, 1949, pp. 20-1).

Brown, M., Sinclair, R. G., Cronk, L. B., Clark, G. C. and Kuitunen-Ekbaum, E. "Intestinal parasites of Eskimos on Southampton Island, Northwest Territories: A preliminary survey" (*Canadian Journal of Public Health,* vol. 39, 1948, pp. 451-4).

Kuitunen-Ekbaum, E. "A case of Dipylidium caninum in a child" (*Canadian Journal of Public Health,* vol. 40, 1949, pp. 115-16).

Wishart, F. O. "Immunization schedules for children" (*Modern Medicine of Canada,* vol. 4, 1949, pp. 23-8, 56-9).

———"Immunization schedules for children" (*Modern Medicine,* vol. 17, 1949, pp. 47-50, 106-12).

Medicine

Under the direction of Professor R. F. Farquharson

The use of the Wellesley Division of the Toronto General Hospital for Second Year teaching has increased the clinical facilities of the Department and eased the strain of increasing numbers of students in the clinical years; the arrangement of the medical wards there is highly suitable for clinical instruction of students.

The increase in the number of clinical groups from twelve to sixteen in the Second Year and from twelve to fifteen in the Third Year has facilitated teaching by reducing the number in each group to ten to eleven students; but with the incoming Second Year of some two hundred students the groups will have to be as large as before, and the problem of providing close critical supervision of each student's work will actually become more difficult. The student must learn by working under guidance; relatively little can be told him in lectures; he must take histories and examine patients and discuss his findings with trained teachers till he acquires skill and confidence and understanding. The increasing size of the clinical classes, which will reach its peak in the next three years, will make it impossible to give adequate personal instruction; the best students always surmount difficulties but average and poorer students will suffer.

Increasing attention is being paid to graduate teaching of internes and casual graduate students in all the University hospitals. The usual Advanced Graduate

Refresher Course was given by the Department in the fall; in the early winter a very successsful short Refresher Course for General Practitioners was given by the staff of St. Michael's Hospital.

The Department announces with regret the retirement of Drs. R. G. Armour, H. K. Detweiler and G. W. Lougheed. They have served long and well and will be remembered for their excellent teaching by their students who now form a large body of our graduates.

The following clinical teachers have been appointed to the staff of the Department: Drs. Donald C. Graham, David J. MacKenzie and Robert M. Taylor.

Research

Reported by Professor R. F. Farquharson

Under the direction of Dr. J. Hepburn, Drs. Burton, Greenwood, Murnaghan and Brown have continued studies on electrocardiographic changes in heart disease and the patho-physiological changes of orthopnoea and cardiac failure, and have begun a detailed and controlled study of the rate of recovery of patients suffering from congestive failure and the effect of changes in regimen and of administration of various drugs. Dr. Kerwin has initiated a study of certain fundamental aspects of electrocardiography preparatory to the designing of a multi-channel cathode ray oscillograph and has continued the study of cardiac catheterization in investigation of congenital heart disease. Dr. D. B. Moran, at St. Michael's Hospital, Dr. Kerwin at the Toronto Western Hospital, and Dr. Hepburn's group at the Toronto General Hospital have been studying the effectiveness of dicumarol therapy in preventing thrombo-embolic complications in patients with cardiac infraction and the results of penicillin therapy in subacute bacterial endocarditis.

Working in close association with the Department of Surgery, Drs. W. A. Oille and D. J. MacKenzie have been studying the series of cases of lung abscess admitted to the Toronto General Hospital between 1937 and 1947.

Dr. I. M. Hilliard has continued his work on the study of respiratory function in chronic disorders of the chest, measuring the arterial oxygen saturation under different conditions such as rest and exercise, the breathing of air and of oxygen, etc.; determinations are made by a modified Milliken oximeter and the usual Van Slyke methods of gas analysis.

Dr. D. Graham completed an investigation of some aspects of protein metabolism in chronic rheumatoid arthritis. He made a careful follow-up study of the course and results of therapy in veterans suffering from Marie-Strümpell spondylitis.

Dr. W. R. Campbell has developed a delicate and accurate method for detection and estimation of rare haemoglobin derivatives. He has worked on the differentiation of chylous and chyliform fluids (ascitic and pleural) and he is studying methods for the more accurate determination of serum amylase.

Dr. K. J. R. Wightman has continued studies on fat absorption in a variety of conditions, with special reference to the fecal excretion of water and non-fatty residues as well as fat.

Using multiple lumen tubes, Dr. R. M. Taylor has been able to demonstrate a marked reduction in glucose absorption from the duodenum in three patients with idiopathic steatorrhoea. Dr. Taylor has also begun a study of the use of blood pyruvate and glucose curves, following ingestion of glucose, as a diagnostic procedure in mild or suspected diabetes.

Working in association with Dr. K. J. R. Wightman, Dr. James Watt has studied the status of fifty pernicious anaemia patients who had been treated for many years, receiving 15 units of liver extract in a single dose each month. These patients appear to be well, and in none had any neurological manifestations appeared or progressed. Yet a marked macrocytosis without anaemia had developed in about one-third; studies of bone marrow smears, pigment metabolism and other dynamic aspects of the haemopoietic mechanism in these patients are in progress.

In co-operation with the Department of Bacteriology and the Rh laboratory at the Hospital for Sick Children, interesting studies have been made on patients with various types of haemolytic anaemia by Dr. Wightman and his associates, who have also investigated the use of various chemotherapeutic agents (urethane, nitrogen mustard and derivatives, aminopterin and stilbamidine) in treatment of leukaemias and other lymphocytic disorders. Combination radiotherapy and chemotherapy in small dosage of each has been effective in some cases.

Dr. M. W. Johnston has continued work which he had begun in New Haven on measurement of serum precipitable (hormonal) iodine in various conditions, and has collaborated with Dr. A. H. Squires in the study of the pharmacological effects of prolonged administration of thyroid.

Drs. H. C. Hair and R. C. Smith, working with Professor P. H. Greey, have continued the study of blood penicillin levels following injection of various types of preparations of penicillin. Dr. Smith has continued to investigate the frequency of occurrence of yeast in the sputum of patients; in a large proportion of cases with cough and sputum from different causes, yeast organisms (Candida albicans) were found.

Dr. J. C. Sinclair and Professor J. A. Dauphinee of the Department of Pathological Chemistry have continued the study of chronic liver disease with special reference to clinical course, the effect of various types of diet, a study of serum proteins and cholesterol and various liver function tests.

Dr. C. Slade has worked under the direction of Dr. J. A. Walters and in association with Dr. W. Graham in the investigation of fibrositis. Results of the study to date indicate that in the majority of patients with "fibrositis" the distress is of emotional origin; these patients suffer from persistent tension and inability to relax, and certain groups of tense postural muscles become tender and painful.

Dr. J. L. Silversides, working under the direction of Drs. H. H. Hyland and J. C. Richardson, has studied the neurological complications of cases of infectious mononucleosis and sporadic encephalitis. He has also made a review of psychic seizures associated with temporal lobe lesions.

Publications

Anglin, A. "The hobby corner" (*Canadian Hospital,* vol. 26, 1949, p. 45).

Armour, R. G. "Encephalitis" (*University of Toronto Medical Journal,* vol. 26, 1949, pp. 190-3).

Brooks, E. F. "Hazards of the uncontrolled use of bromides" (*Bulletin of the Vancouver Medical Association,* vol. 25, 1948, pp. 15-19).

Dauphinee, J. A. and Sinclair, J. C. "Primary biliary cirrhosis" (*Proceedings of the Royal College of Physicians and Surgeons of Canada,* Nov., 1948, pp. 45-9).

Dickson, R. C. "Amoebiasis in veterans" (*Proceedings of the Royal College of Physicians and Surgeons of Canada,* Nov., 1948, pp. 32-6).

Farquharson, R. F. "Extreme insufficiency of the anterior lobe of the pituitary gland" (*Postgraduate Medicine,* vol. 5, 1949, pp. 112-17).

———"The present status of streptomycin in the treatment of tuberculosis" (*Canadian Hospital,* vol. 25, 1948, p. 50).

Farquharson, R. F., Mather, J. M., McClure, A. D. and Sellers, A. H. "Studies on tetanus immunization in the R.C.A.F." (*Canadian Journal of Public Health,* vol. 40, 1949, pp. 51-9).

Farquharson, R. F. and Sinclair, J. C. "Constitutional mild icterus: Follow-up study over a period of many years" (*Transactions of the Association of American Physicians,* vol. 61, 1948, p. 270).

Greenwood, W. F., Barger, A. C., DiPalma, J. R., Stokes, J. and Smith, L. H. "Factors affecting the appearance and persistence of visible cutaneous reactive hyperemia in man" (*Journal of Clinical Investigation,* vol. 27, 1948, pp. 187-97).

Hepburn, J., Van Wyck, H. B., Rykert, H. E., Gray, K. G., Henderson, D. N., Detweiler, H. K., Campbell, W. R., Stokes, A. B. and Brooks, E. F. "A symposium on the termination of pregnancy" (*University of Toronto Medical Journal,* vol. 26, no. 6, 1949, pp. 215-32).

Hyland, H. H. "Periodic paralysis" (*Proceedings of the Royal College of Physicians and Surgeons of Canada,* Nov., 1948, pp. 18-20).

JOHNSTON, M. W. and SALTER, W. T. "Iodine: Radioactive and stable in normal and cancerous tissues" (*Transactions of the Association of American Physicians,* vol. 61, 1948, pp. 210-35).
———"Tracing the thyroid hormone in peripheral tissues" (*Journal of Clinical Endocrinology,* vol. 8, 1948, pp. 911-33).
———"Turnover rates as measured by radioiodine" (*Transactions of the American Physiological Society,* 1948).
KERR, R. B. and FERGUSON, J. K. W. "The metric system and the nurse" (*Canadian Hospital,* vol. 26, 1949, p. 29; *Canadian Nurse,* vol. 45, 1949, p. 361).
MURNAGHAN, D. P. "Clinical electrocardiography" (*University of Toronto Medical Journal,* vol. 26, 1949, pp. 167-75).
———"Rupture of aortic aneurysm into the superior vena cava with obstruction" (*Canadian Medical Association Journal,* vol. 59, 1948, pp. 370-3).
OGRYZLO, M. A. "Chronic inflammatory lesions of skeletal muscle in rheumatoid arthritis and in other diseases" (*Archives of Pathology,* vol. 46, 1948, pp. 301-12).
OILLE, W. A. "Primary or idiopathic pleurisy with effusion" (*Proceedings of the Royal College of Physicians and Surgeons of Canada,* 1948, pp. 27-30).
OWEN, T. "Migrainous disorders of the smooth muscle system" (*Canadian Medical Association Journal,* vol. 60, 1949, pp. 7-11).
SLADE, C., "Porphyria" (*Canadian Medical Association Journal,* vol. 60, 1949, pp. 392-5; *Bulletin of the Academy of Medicine, Toronto,* vol. 22, 1949, pp. 141-8).

Obstetrics and Gynaecology

Under the direction of Professor H. B. Van Wyck

During the session 1948-1949, there have been the following changes in the staff. Dr. R. B. Meiklejohn has been appointed as Assistant Attending Obstetrician and Gynaecologist on Dr. Armstrong's staff at the Western Hospital. As the Wellesley Hospital is now the Wellesley Division of the Toronto General Hospital, Dr. W. A. Dafoe rejoins the staff of the Toronto General Hospital as Attending Obstetrician and Gynaecologist in charge of the Department of Obstetrics and Gynaecology in the Wellesley Division.

The Department is pleased to announce the appointment of Dr. Crawford Shier as Fellow on the Clinical Staff of the Toronto General Hospital, and Dr. Cullen Bryant as voluntary assistant in the Outpatient Gynaecology Clinic.

The following promotion has been announced during the year: Dr. J. R. McArthur to Associate.

The Department is pleased to announce that Dr. D. N. Henderson, Dr. Geraldine Maloney and Dr. Crawford Shier have been awarded Fellowship in the Royal College of Surgeons of Canada by examination; and that Dr. Gordon Chambers passed the certification examination of the Royal College.

Dr. Donald Van Wyck was appointed a Fellow during 1948-49 as Resident in Obstetrics and Gynaecology at the Toronto General Hospital. He has received an appointment under Dr. TeLinde at the Johns Hopkins Hospital for further study in 1950.

During the past year, Dr. F. E. Bryans has been working at the Department of Zoology at Harvard University under Professor Hisaw; and Dr. W. J. McGanity at Vanderbilt University under Dr. Darby. Both Dr. Bryans and Dr. McGanity have been appointed senior internes at the Toronto General Hospital, Department of Obstetrics and Gynaecology for a term of training beginning July 1st, 1949.

During the past year the staff, comprising the groups from each of the three teaching hospitals, has been working in increasingly closer co-operation. Three combined staff meetings were held during the year. One at the Toronto General Hospital at which the following papers were read:

(1) "Postpartum Cerebral Thrombosis," by Dr. D. J. Van Wyck
(2) "Early Diagnosis of Cervical Carcinoma," by Dr. Joslyn Rogers
(3) "Histaminase Activity in Pregnancy," by Dr. W. H. Allemang
(4) "Guterman Test in the Management of Threatened Abortion," by Dr. W. H. Fry.

Another was held at St. Michael's Hospital at which the psychosomatic aspects of Obstetrics and Gynaecology were discussed by Dr. E. F. Brooks and Dr. E. S. Macdonald; and one at the Toronto Western Hospital at which Dr. R. H. Wesley read a paper on "A Study of Maternal Mortality", Dr. J. H. Fraser on "Report on Mass Chest X-ray of Prenatal Patients", and Dr. F. E. Kinsey on "X-ray Pelvimetry by the Snow Technique".

At a Clinical Basic Science Conference, Dr. John Mann discussed "Oedema as Related to Pregnancy".

The Staff is grateful to Dr. A. L. Chute and Dr. H. J. Barrie who contributed to the programmes. The Clinical Pathological Conferences held by Dr. William Boyd on gynaecological subjects were attended by all three hospital groups and much appreciated.

Among the visitors to the Department during the past year were Dr. E. G. Watters of the Margaret Hague Hospital, Jersey City, and Dr. Robert J. Lowrie of the City Hospital, New York.

Grand Rounds have been held in the three hospitals each week throughout the year and an effort has been made to make visitors from out of town welcome. The schedule of these rounds is available upon request at the Dean's office and it is hoped that returning graduates on their visit to Toronto may avail themselves of the open invitation to attend.

On each Monday afternoon, clinical conferences have been held for the fourth year class. These have been distributed among the three hospitals. At these conferences current cases of interest have been discussed and the students provided with a mimeographed copy of the case history and the staff comment. On Thursday afternoon at each of the hospitals, students of the fourth year have read these on specific subjects before the group of their fellow students. These seminars have been presided over by members of the staff. It is gratifying to be able to record that the theses have been of a very high standard, and it is believed that an opportunity for formal presentation of a scientific paper such as these seminars provide is very valuable training for the students. It is also noteworthy that the majority of the students were able to illustrate their theses by lantern slides, the stock of which has been markedly increased during the past two years. An effort was made to make these seminars formal in the usual well-conducted manner of a scientific session. It is hoped that visiting graduates will find it beneficial to attend these clinical conferences and seminars and take part in the discussion. Such visits of the graduates to these undergraduate sessions are very stimulating and gratifying to both staff and students.

An effort has been made during the past year to increase the stock of visual aids. Many new slides have been added to our catalogue and the following films have been presented to us:—"Leukorrhoea—diagnosis and treatment", by the Ciba Company; "Studies of Human Fertility" by the Ortho Pharmaceutical Corporation (Canada) Limited; "Kielland's Forceps" by Reckitt and Colman (Canada) Limited; "Pudenal Nerve Block", by Dr. Goldstein.

In conjunction with other departments, an advanced refresher course in Obstetrics and Gynaecology was carried out in September 1948 for candidates who wished concentrated instruction preparatory to going up for examination either for Fellowship in the Royal College of Physicians and Surgeons or for certification as specialists in Obstetrics and Gynaecology. Twenty-two applicants took the course and it is proposed to repeat the advanced refresher course this fall.

One of the most important functions of the Department is the providing of facilities for students who wish to qualify in Obstetrics and Gynaecology. The course that at present is available in this Department comprises two years' training as senior interne, one year as Resident, and one year as Fellow in Obstetrics and Gynaecology or one of the basic sciences. This year, an exchange has been arranged with the Department of Surgery by which our senior interne in training receives a period of training in general surgery. Posts available are naturally limited but application

may be made to the Dean or the head of the Department. Arrangements have been made to include among our senior internes a graduate who wishes special work in Obstetrics and Gynaecology with a view to general practice. This innovation should prove a valuable addition to our training facilities.

In addition to the usual staff, the Department is grateful for the conscientious help received from the voluntary assistants:—Dr. Magnus Spence, Dr. John Oswald, Dr. William Flatt, Dr. Herbert Tait, Dr. R. G. MacKenzie, Dr. J. C. McKellar, Dr. A. L. MacKenzie, Dr. B. E. Meek, Dr. Gordon Chambers, Dr. J. T. McCormack and Dr. Cullen Bryant.

Research

Reported by Professor H. B. Van Wyck

The Rh committee, which was established under the chairmanship of Dr. P. Greey, with Dr. Low representing the Department, for the investigation of the Rh factor problem in the Toronto area in November, 1946, has carried on actively since that time. At first the survey included only public ward cases in the Toronto General, Western and St. Michael's Hospitals. By April, 1947, it had been enlarged to include six more hospitals, namely Toronto East General, St. Joseph's, Women's College, Wellesley, Mount Sinai and the Hospital for Sick Children. Beginning May 18, 1947, arrangements were concluded for a complete prenatal blood examination for all private obstetrical patients in the hospitals taking part in this survey. Besides a routine examination of Rh factor and antibodies, this examination includes haemoglobin estimation, blood grouping and serological tests for syphilis. It has been found that approximately 1 per cent of obstetrical patients have been isoimmunized. At a clinical basic science conference, the Rh problem was discussed, Dr. D. M. Low representing the Department in the discussion of the clinical aspects. This complete survey of two years' duration ending June 30, 1949, will, it is estimated, have covered over 20,000 patients. During the coming year, 1949-50, it is expected that a report of the results of the survey with the experience gained in the treatment of isoimmunized mothers and the results from the treatment of haemolytic disease of the newborn will be prepared by this Department with the co-operation of the Department of Pathology and the Hospital for Sick Children.

Under the direction of Dr. Mann, the research on the mechanism producing convulsions in eclamptic toxaemia is progressing. Assembly of the physical equipment in a room for this purpose at the Burnside Obstetrical Department has been completed and some clinic trials have already been undertaken. In conjunction with the Department of Medicine, electroencephalogram investigation is being done on potential eclamptic patients with a view to increasing our knowledge of the pre-eclamptic state.

In the Pathological Department under the direction of Dr. D. N. Henderson, a review of tubal pregnancy which began last year has been completed and the results of this study will be published in a few months. The major investigation carried on in the laboratory during the present year has been the study of intra-epithelial carcinoma of the cervix or carcinoma-in-situ. Up to the present, approximately 150 cervices have been completely sectioned and studied, as well as 7 cases of carcinoma-in-situ of the cervix. Where possible, the histological changes noted in the cervix are correlated with cytological changes noted in the vaginal smears. It is hoped that this study will help clarify the rather equivocal status of carcinoma-in-situ, and establish the value of vaginal smear examination in the detection of early unsuspected cervical carcinoma.

Dr. Maloney has been carrying on an investigation of the value of cytological smear examination in the determination of prognosis and the reaction to therapy of tumours treated by radiation. The work has consisted in the follow-up of patients under treatment in the Department of Radiotherapy for cancer of the cervix and began in the summer of 1947. The routine at first was as follows: Smears were taken

on all new patients who presented themselves at the Cancer Clinic. Cervical smears were then given at weekly intervals during the treatment to those patients in whom a diagnosis of cancer had been substantiated by biopsy. Following the completion of the therapy, smears were again made. Approximately 150 patients have been followed to date. The method of procedure has been revised in recent months, inasmuch as attention is now being concentrated on patients clinically diagnosed as stage 1 and 2. Scrapings of the cervix are taken with an Ayre's wooden spatula, stained with Bonin's solution and sectioned. It is believed that with this method a more satisfactory report can be made regarding the clearing of viable cancer cells from the cervix and it is the objective to be able to predict as soon as possible after the initiation of treatment whether or not a given case is going to be radio-resistant or not.

The treatment and investigation of uterine, vulvar and ovarian cancer have been continued by Dr. W. G. Cosbie and Dr. J. R. McArthur who represent the Department in the Ontario Institute of Radiotherapy.

In co-operation with the Department of Public Health Nutrition under the direction of Professor E. W. McHenry, a nutritional survey was completed in the Prenatal Clinic, the results of which have been published.

On July 1, 1949, Dr. M. V. Morton will begin an evaluation of recent research methods of pain relief in the first and second stage of labour.

Dr. John Fletcher of the Department of Paediatrics has continued his studies at the Burnside of the problems related to anoxia, atelectasis and prematurity.

Dr. J. R. McArthur has continued his studies in conjunction with the Department of Medicine on the anaemias of pregnancy. At the Ontario Institute of Radiotherapy, Dr. McArthur has completed a survey of the results of treatment of carcinoma of the corpus uteri.

Dr. Watson has continued observations on cases in which a diagnosis of non-specific pelvic infection and secondary type infection is entertained. Dr. Watson also reports experimental work in the successful implantation on denuded areas of the cervix uteri of the same patients from whom grafts were obtained by curettement in selective cases.

Dr. W. A. Dafoe reports the investigation of substances in the urine of pregnant human beings which are capable of influencing the growth of plants and which do not occur in non-pregnant urine. This investigation has not yet been completed. Dr. Dafoe has also continued his work in the development of an electronic apparatus to replace the stethescope for the observation and investigation of foetal heart sounds.

Publications

Cosbie, W. G. "Carcinoma of the vulva" (*Canadian Medical Association Journal,* vol. 60, Jan., 1949, pp. 64-7).

Henderson, D. N. "Difficult and delayed labour" (*Vancouver Medical Association Journal,* vol. 15, no. 8, May, 1948, p. 267).

———"Eclamptic toxaemia" (*Vancouver Medical Association Journal,* vol. 15, no. 8, May, 1948, p. 261).

Low, D. M. "The value of prenatal blood examination" (*Health,* March-April, 1949).

McGanity, W. J., McHenry, E. W., Van Wyck, H. B. and Watt, G. L. "An effect of pyridoxine on blood urea in human subjects" (*Journal of Biological Chemistry,* vol. 178, no. 1, March, 1949, pp. 511-16).

Maloney, G. "Carcinoma of the uterus" (*Health,* Sept.-Oct., 1948).

Mann, J. "Prenatal care" (*Health,* Oct.-Nov., 1948).

Scott, W. A. "Shock in obstetrics" (*British Medical Journal,* vol. 2, Oct. 25, 1947, p. 647).

Scott, W. A. and Maloney, G. "Genital urinary fistulas" (*Urological and Cutaneous Review,* vol. 52, no. 8, 1948, pp. 461-3).

Van Wyck, H. B. Annual address to the Osler Society, McGill University (*McGill Medical Journal,* vol. 17, no. 3, Oct., 1948).

———"Humanism and medicine" (*University of Toronto Medical Journal,* vol. 26).

———"The problems of sterility" (*Health,* Jan.-Feb., 1949).

Van Wyck, H. B., Henderson, D. N. *et al.* "A symposium on the termination of pregnancy" (*University of Toronto Medical Journal,* vol. 26, no. 6, 1949, pp. 215-32).

Ophthalmology

Under the direction of Professor A. J. Elliot

The Department of Ophthalmology carried on its postgraduate training courses during the session 1948-49. The graduate instruction in Ophthalmology in the teaching hospitals in Toronto has been co-ordinated under the direction of the University. The first year on a Fellowship, the value of which is approximately $1400, the student spends in one of the basic sciences of Ophthalmology, and the final two years are spent on the intern service of one or more of the University teaching hospitals. Approximately four hours of didactic teaching are arranged for the students by members of the staff each week from October to May. On Saturday mornings staff ward rounds are made at the Toronto General Hospital and are attended by the interns from the other teaching hospitals. The following courses are given: Geometric and Physiological Optics, Physiology of the Eye, Principles and Practice of Biomicroscopy, Perimetry, Ocular Therapeutics, Medical Ophthalmology, Pathology of the Eye, Bacteriology and External Diseases of the Eye, Embryology and Developmental Anomalies of the Eye, Ocular Motor Anomalies, Anatomy of the Orbit, Skull and Brain, Radiological Ophthalmology, Industrial Ophthalmology, Intra-ocular and Plastic Surgery, Pathology of the Visual Pathways, Refraction, Neuro-ophthalmology, Glaucoma. Senior interns were given instruction in the preparation and presentation of scientific papers, and several presented papers before the Section of Ophthalmology, Academy of Medicine, which will be published later.

The postgraduate course in Ophthalmology was strengthened by a grant of $2000 from the Canadian National Institute for the Blind for a Fellow in research in ocular genetics. It is hoped that information will result that will be of assistance for a better understanding of some of the serious inheritable eye diseases.

In the undergraduate teaching of Ophthalmology, the ocular indications of systemic disease were stressed. Special attention was given to teaching students the commoner but practical aspects of infectious eye diseases and minor traumatic conditions. It is hoped that, in addition to the four University teaching hospitals now giving undergraduate clinics in Ophthalmology, the facilities of the Eye Department at Sunnybrook Hospital will be utilized for the undergraduate medical students during the next academic session.

A combined Refresher Course in Ophthalmology and Otolaryngology was held for a week in January and the guest speaker in Ophthalmology was Dr. Ramon Castroviejo of New York City. Dr. Castroviejo gave two lectures on cataract surgery and its complications and an excellent operative clinic. Members of the staffs of the four teaching hospitals combined in providing lectures and surgical clinics on recent developments in Ophthalmology.

Dr. O. B. Richardson has spent the past winter continuing his postgraduate studies in ophthalmic pathology at the Army Institute of Pathology, Washington, D. C. and will return to the University to direct this work in the Department. The Department was grateful to referring physicians for forwarding specimens, enucleated eyes, etc.

Dr. H. L. Ormsby has continued his special studies in ophthalmic bacteriology and external diseases and has spent some time working under Professor Thygeson at the University of California and under Professor J. H. Allen at the University of Iowa. He will return to the University of Toronto to head this special study in the Department of Ophthalmology.

Plans were further advanced during the past year regarding the proposed Eye Institute and the erection of a building with adequate public ward eye beds, semi-private and private accommodation, eye library, lecture theatre, operating rooms, optical shop, research laboratories, etc. The Department will be grateful to receive funds and bequests towards the endowment of research in the proposed Eye Centre.

Dr. J. C. McCulloch was awarded the Reeve Prize; this award is made for the best scientific research accomplished in any Department in the Faculty of Medicine by one who has held an appointment on the staff for not more than five years. Dr. McCulloch was awarded this prize for his study in conjunction with Dr. R. J. P. McCulloch on "A Hereditary and Clinical Study of Choroideremia"; this has added greatly to the knowledge of this previously obscure hereditary ocular condition. The disease was found in over 80 descendants of a family of 500 individuals who were studied.

Dr. A. E. MacDonald was honoured by being asked to contribute to the special number to mark the occasion of the eightieth birthday of Sir John Herbert Parsons published by the *British Journal of Ophthalmology*. His paper on Lindau's Disease has added to the knowledge on this important subject.

Dr. H. M. Macrae and Dr. A. J. Elliot lectured before the annual meeting of the Ontario Medical Association during the past session; the latter also spoke before the Canadian Medical Association at their annual meeting in Saskatoon. Drs. A. L. Morgan, A. E. MacDonald, J. C. McCulloch, W. P. Callahan and J. S. Crawford presented scientific papers at the annual meeting of the Canadian Ophthalmological Society.

Research

Reported by Professor A. J. Elliot

Dr. J. F. Aikenhead worked under Professor J. K. Ferguson in the Department of Pharmacology. He extended the research done by Dr. H. S. Hamilton during the previous year on local anaesthetic agents. He developed a technique of retrobulbar nerve block in guinea-pigs which gave fairly constant results and which may be useful for the laboratory assessment of local anaesthetics. He also did extensive tests on local toxicity and general toxicity of local anaesthetic agents. In addition he gave assistance to Professor Ferguson on a problem of exophthalmos in rats.

Dr. S. Y. Shirley worked under Professor D. Y. Solandt in the Department of Physiological Hygiene. He was assigned a problem in colour vision. The greater part of his year was taken up in developing apparatus for the projection of various coloured lights. With such an apparatus it should be possible to do a great number of tests on the effect of different colours on the visual functions.

Dr. S. A. Solomon worked under Professors William Boyd and E. A. Linell in the Department of Neuropathology. During the year he developed a satisfactory technique for obtaining eyes at autopsy. He obtained a number of eyes showing important conditions which we previously have not had the opportunity to study. His work has not produced a concrete item of research but the eyes he has obtained have contributed to the work of several men in other fields, and has been invaluable.

Dr. M. Shusterman has worked in the Department of Bacteriology under Professors Boyd and Greey. He has supervised all the eye bacteriology related to his department. His results should help to elucidate the aetiology of at least one type of corneal ulcer. He has also obtained a culture of Toxoplasma from Dr. J. K. Frenkel, United States Department of Health, Hamilton, Montana. He has carried this culture in various laboratory animals, has made a skin test antigen and carried through antibody formation against this organism. He has tested about fifty cases with eye findings which might possibly indicate the presence of Toxoplasma. He has also tested a series of over a hundred normal humans as controls. His results are very suggestive that Toxoplasma may be present in the Toronto area.

Certain facts about this last research should be emphasized: it is not without danger to the researcher; this is probably the first time Toxoplasma has been grown in Canada; never before has there been any concrete basis for the suggestion that Toxoplasma is present in the Toronto area.

PUBLICATIONS

ELLIOTT, A. J. "Recurrent intraocular haemorrhages in young adults: Eales' disease" (*Transactions of the Canadian Ophthalmological Society,* vol. 1, 1948, p. 39).

———"Treatment of ocular injuries in general practice" (*University of Toronto Medical Journal,* vol. 24, 1949, p. 133).

HILL, J. C. "Visual manifestations of head injuries" (*Canadian Medical Association Journal,* vol. 60, 1949, p. 464).

MACDONALD, A. E. "Lindau's disease: Progression in affected family" (*British Journal of Ophthalmology,* vol. 32, 1948, p. 575).

MORGAN, A. L. and PEARSE, E. "Orthoptics: Some notes on the evaluation of results" (*Transactions of the Canadian Ophthalmological Society,* vol. 1, 1948, p. 113).

Oto-Laryngology

Under the direction of Professor P. E. Ireland

The past year has been important for the initiation of a programme of Basic Research to accompany the postgraduate training. It has been possible to have three graduates to work on specific problems due to the funds made available by the E. P. Taylor Fellowship. Each of these men has had previous training in the specialty. In addition to this there has also been a small sum to assist Dr. D. P. Bryce in a travelling scholarship for six months. This was in order to study the teaching and clinical methods in the better Canadian and American University centres. His itinerary included Montreal, Boston, New York, Philadelphia, Chicago and St. Louis. The information he obtained will be very valuable to the Head of the Department.

The undergraduate teaching in both the third and fourth medical years has been revised and improved. The number of hours assigned to the teaching of our specialty still seems inadequate. The combined Refresher Course with Ophthalmology held in January was well received and the attendance was excellent. It is proposed to repeat this next year as it attracts a group of Canadian specialists not served by any suitable American course. The postgraduate clinical course, which includes clinical teaching at the various University Hospitals combined with didactic teaching in the Basic Sciences, is well established. Two of our graduates are candidates for the first fellowship examination in Oto-Laryngology of the Royal College of Surgeons (Canada). The course was inspected and approved by the Credentials Committee of the American Board of Oto-Laryngology.

In the past year two generous gifts have been donated to further the study of the Problem of the Hard of Hearing. One of these was from Andre Dorfman to the Toronto General Hospital Clinic, and the more recent from the Atkinson Foundation to the Hospital for Sick Children. The Hospital for Sick Children should have facilities for the study and treatment of deafness in children comparable to any centre when the new hospital is available. This project is under the able direction of Dr. D. E. S. Wishart, chief of staff in their Department of Oto-Laryngology, and assistant professor in this Department.

RESEARCH

Reported by Professor P. E. Ireland

Dr. Brydon Smith has combined his operative skill with the facilities of the laboratory in the Anatomy Department in the problem of endosteal regeneration of bone. This work was under the direction of Professor A. W. Ham of the Department of Anatomy. Dr. Blair Fearon has instituted improved methods of segmental mapping of the bronchial tree and preparations in plastic of the human labyrinth. He has also prepared a study on the comparative anatomy of the labyrinth in experimental animals. These are all to be published. Dr. S. Hughes has been

engaged in a study of paracusis in conjunction with Dr. J. A. Sullivan and Mr. W. E. Hodges of the Department of Physics and the Research Department of the Royal Canadian Air Force School of Medicine.

The acoustic laboratory, which is under this Department and the Department of Physics, has continued the study of deafness under the direction of Dr. J. A. Sullivan. Dr. Sullivan and Mr. W. E. Hodges have prepared a report to the Department of Transport, Civil Aviation Branch, on the otological requirements for civil aviation.

Dr. D. E. S. Wishart has continued his research on the problem of deafness in children. A new method of testing the hearing loss in children is being developed in his department. Elaborate plans for this important study are being initiated for the new Hospital for Sick Children.

Publications

McCart, H. "The future of our specialty" (*Laryngoscope,* vol. 59, no. 4, 1949, pp. 417-24).
Sullivan, J. A. and Hodges, W. E. "The effect of the differential mobility of the windows of the cochlea on the mechanism of hearing" (*Archives of Otolaryngology,* vol. 49, 1949, p. 63).
Wishart, D. E. S. "Rhinology in children: Resumé of and comments on the literature for 1947" (*Laryngoscope,* vol. 58, no. 9, 1948, pp. 897-954).

Paediatrics

Under the direction of Professor Alan Brown

The plan of teaching, previously outlined and considered two years ago whereby the Departments of Obstetrics and Paediatrics were brought into closer co-operation, is still proving to be a most satisfactory arrangement, and we feel the students are pleased with it.

According to a recent survey of the Medical Schools of the United States and Canada, we still require more hours of Paediatric teaching—the reason being that seventy-five to eighty per cent of the children of our country and of the United States are still looked after by general practitioners. The main object of our undergraduate teaching is to sufficiently acquaint the student with the problems that he will meet in private practice.

During the past year we have had nine postgraduate students, together with a number of visitors. Our postgraduate students come from various countries, including China, Sweden, Yugoslavia, Newfoundland and very few from Canada.

During the last thirty years the Hospital for Sick Children has trained approximately seventy-three per cent of the Paediatricians in Canada. This, I think, is somewhat of a record for any institution in performing this type of service.

Dr. Gladys Boyd was made a Fellow of the American College of Chest Physicians, and Dr. J. H. Ebbs, Dr. W. A. Hawke and Dr. A. L. Chute received the F.R.C.P.(C).

It is with great sorrow that I record the recent death of Dr. Frederick F. Tisdall, O.B.E., M.D., F.R.C.P. (C), F.R.C.P. (Lond.). In this death the Hospital for Sick Children, the University of Toronto and the Medical Profession at large have lost an excellent teacher, organizer and demonstrator as well as a brilliant research worker. At the time of his death Dr. Tisdall was Associate Professor of Paediatrics, University of Toronto, and Physician to the Hospital for Sick Children, also Director of Research Laboratories, Department of Paediatrics and Hospital for Sick Children.

During the war he was Consultant on Nutrition to the Royal Canadian Air Force with the rank of Group Captain. He was a member of the Canadian Council on Nutrition; Chairman, Committee on Nutrition of the Canadian Medical Association; Chairman, National Nutrition Committee, Canadian Red Cross Society; Member of the Food and Nutrition Board, National Research Council, Washington; and for some years was a member of the Standing Advisory Committee on Nutrition of the Food and Agriculture Organization of the United Nations.

He was the author of the book *The Home Care of the Infant and Child*, and co-author with Alan Brown of the text-book *Common Procedures in the Practice of Paediatrics*. In addition to this he published over one hundred and twenty-five scientific articles, most of which had to do with the subject of Nutrition.

His high scientific attainments were coupled with endearing personal qualities which made him welcome everywhere he went, and in every circle in which he mingled.

Research

Reported by Professor A. Brown

Intensive work is being carried out, under Dr. A. L. Chute, on the vascular lesions and other degenerative changes occurring in diabetics. With the co-operation of the Department of Medicine, a clinic for the follow-up study of diabetic children who graduate from the Hospital for Sick Children has been set up in the Toronto General Hospital. Clinical investigation of these cases is being carried out to determine the factors affecting the arteriosclerosis which so frequently develops at an early age in these patients. The Banting and Best Department of Medical Research is co-operating in this project and is undertaking observations on the role of cholesterol in the development of arterial lesions. Work has indicated that certain types of diet produce arteriosclerosis in diabetic rats under certain circumstances. These studies are being amplified in an attempt to assess the importance of different dietary factors in the development of these lesions. Through this work, it is hoped that knowledge may be gained which may be transferred to the prophylaxis and therapy of degenerative diseases of the cardiovascular system so commonly encountered.

To make possible the carrying out of deliberate cardiac surgery, in conjunction with the Department of Surgery of the Hospital apparatus has been devised which in animals maintains a circulation to the body while at the same time the circulation through the heart has been stopped. A number of factors have had to be overcome, such as the excessive blood loss following operative procedure due to the amounts of heparin which must be employed to keep the external circuit functioning. The occurrence of post-operative pneumothorax and pulmonary collapse have also been troublesome. Though in most cases the animals have not survived for any great length of time, it is felt that with further work on this problem a suitable method may be devised which will allow the surgeon to perform all desired types of cardiac surgery in the human. This work is being carried out by Dr. J. Keith and Dr. W. T. Mustard.

A comparison has been made of the retention of calcium when fed as bone meal and as milk in the adult human. The results indicate equal availability of the calcium in these two dietary sources.

An investigation of the biological value of the protein of cooked bone is in progress. These studies are being conducted by Dr. T. G. H. Drake and Dr. S. H. Jackson.

Observations on the retention of fluorine are nearing completion.

Preliminary observations in the broad field of fat absorption and transportation are being undertaken, including the determination of coincidental mobilization of vitamin A in the liver during the production of fatty livers in rats and variations in the intestinal phosphatase during fat absorption.

Attempts are being made by Dr. J. F. McCreary and Dr. S. H. Jackson to produce fibrosis of the pancreas in rats by administration of zinc as a means of studying the sequence of clinical and pathological findings encountered in fibrocystic disease of the pancreas. A review of the Hospital's clinical records and pathological material has revealed the occurrence of nearly 100 hundred cases of fibrocystic disease of the pancreas during the past ten years. It has become increasingly apparent that for accurate diagnosis of this condition there must be estimation of intestinal

enzyme content, glucose and vitamin A tolerance tests and radiological examination, no single test being sufficient. Through the administration by mouth of certain saponifiers, such as "Tween 80," intestinal absorption of fat is improved. The value of these substances is being investigated in the treatment of diseases with which fat indigestion is associated, including coeliac disease and fibrocystic disease of the pancreas.

During the past year, in collaboration with the Connaught Laboratories, studies have been made on the clinical, field and laboratory aspects of poliomyelitis. In comparison with the preceding year, cases have been fewer in number, but a higher percentage have exhibited paralysis, especially of the bulbar type. Certain of these patients have been given treatment in the respirator, accompanied by tracheotomy. From a field standpoint, a special study has been made of the occurrence of the disease in a nonparalytic form in Dufferin County. With the co-operation of the physicians and the Medical Officer of Health of that county, the virus of poliomyelitis has been recovered not only from paralytic cases and their contacts but also from children suffering from only a minor febrile illness. Throughout this last winter and spring cases of minor febrile illnesses in the Dufferin district have been followed in an attempt to find the mode of spread of poliomyelitis. These studies are under the direction of Dr. L. N. Silverthorne.

Dr. J. H. Ebbs' work has continued on the production and therapy of coeliac disease in rats. The effect of further components of the vitamin B complex in controlling the condition has been evaluated.

In co-operation with the Department of Biology, clinical records of cases of coeliac disease are being further analysed with special reference to family history of diabetes. A study of the occurrence of fatty livers has been started in an attempt to correlate the presence and severity of infection with the degree of change in the liver.

A trial model of a small, simple, inexpensive combined aspirator and oxygen administrator has been designed and is being tested. It is anticipated that this apparatus will be exceedingly useful in labour rooms, premature nurseries and infant wards.

Dr. J. P. Fletcher, in conjunction with the Department of Obstetrics, is carrying out a study of the significance of the walking reflex of the newborn infant, with the hope of improving methods for the examination of the central nervous system in the young infant.

In co-operation with the Departments of Surgery and Pathology, work is continuing on the Rh factor. In erythroblastosis foetalis the mortality has been reduced by employment of replacement transfusion.

Under Dr. C. E. Snelling the use of anti-folic acid compounds in the treatment of leukaemia is being investigated in co-operation with the Department of Pathology. While not a cure, in many cases these substances appear to have prolonged life and rendered the patient more comfortable.

Work is continuing on the clinical and pathological aspects of the many cases of bronchiectasis under observation in this Hospital. Studies upon erythema nodosum and lung cysts are being prepared for publication.

Our facilities for the study of active tuberculosis have been increased by one hundred beds, and observations on the effect of treatment of tuberculosis with streptomycin, dihydro-streptomycin and promizole are continuing. Bronchogenic observations of the bronchial tree in childhood tuberculosis are being made in co-operation with the Department of Oto-Laryngology. Cytological studies are progressing on the sternal bone marrow in miliary tuberculosis. This work is being carried out by Dr. Gladys Boyd.

Controlled clinical trials with a number of the newer antihistamine drugs are being conducted in the Allergy Clinic and their value in various allergic conditions is being assessed.

In association with the Department of Oto-Laryngology radium treatment of the nasopharynx in certain cases of asthma in children is also being investigated. This work is being conducted by Dr. J. R. Ross and Dr. H. E. Edwards.

During the past year Dr. Keith's study on the prophylactic use of penicillin was completed. The penicillin was given by mouth to a large group of patients in the Heart Clinic in an attempt to prevent upper respiratory infections, particularly those of streptococcal origin. It was found, as a result of this investigation, that the number of streptococci in the throats of the treated patients was greatly reduced as compared with that found in the controls.

Studies are under way, in co-operation with the Toronto Department of Public Health, in an attempt to discover as many cases of heart disease in children as possible. These studies are being conducted in the clinic of the Hospital for Sick Children and in the Public Health Department of the city of Toronto.

Studies by means of angiocardiography in congenital heart disease have continued during the past year. Over eighty cases of congenital heart disease have been examined by this method and a great variety of defects have been demonstrated. Investigation of cases of congenital heart disease by means of an intracardiac catheter has been proceeding. Data have been collected on pressures and oxygen contents in various heart chambers in a large group of different types of congenital heart anomalies.

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Silverthorne, N., Goodfellow, A. M., Anglin, C., Rhodes, A. J., Roy, T. E. and Snelling, C. E. "Non-paralytic poliomyelitis" (*Canadian Medical Association Journal,* vol. 60, 1949, pp. 356-9).

Tisdall, F. F. *et al.* "Medical resurvey of nutrition in Newfoundland, 1948" (*Canadian Medical Association Journal,* vol. 60, April, 1949).

Tisdall, F. F. *et al.* "The nutrition and health of the James Bay Indian" (*Canadian Medical Association Journal,* vol. 59, 1948, pp. 505-18).

Tisdall, F. F., Wilson, M., Mitchell, J., Gershaw, N., Rouse, G., McCreary, J. F. and Sellers, A. H. "Final report on the Canadian Red Cross food parcels for prisoners-of-war" (*Canadian Medical Association Journal,* vol. 60, 1949, pp. 279-86).

Wilson, W. J. "Congenital anomalies requiring early recognition and immediate treatment," (*Bulletin of the Academy of Medicine,* Toronto, Oct., 1948).

Pathological Chemistry

Under the direction of Professor James A. Dauphinee

There have not been any changes in the senior professional staff during the present year. Dr. A. G. Gornall, Assistant Professor of Pathological Chemistry, having been awarded a Nuffield Fellowship, and having obtained leave of absence

from the University has been spending seven months in Great Britain, where he has worked with Dr. G. F. Marrian, Professor of Biochemistry, at the University of Edinburgh, and with others in London and elsewhere who are eminent in the field of the chemistry of the steroid hormones. On his return, Dr. Gornall will take charge of a new research laboratory in the Department which is being set up largely through a grant obtained from the Department of Public Health. This laboratory will be devoted to the study and investigation of fundamental and clinical problems in the realm of endocrinology and it is hoped that it will serve a very useful purpose, not only as a research laboratory, but also as a source of stimulus and information for all those who are interested in the endocrine field.

In regard to the Junior staff we have been fortunate in being served by highly capable and enthusiastic Fellows, who have done much to set a high standard of teaching. Unfortunately most of these Fellows are in the process of securing the training necessary to allow them to proceed to the examinations of the Royal College of Physicians and Surgeons of Canada. For the most part, these Fellowship Candidates find it impossible to remain in the study of basic science for more than the required year. During this period they undoubtedly learn much which will be of considerable value to them in their subsequent clinical studies, but it is not possible for them to accomplish much in the way of investigation during this time. They just begin to know their way about the laboratory when the time comes for them to stop and go elsewhere, and the work which they have begun so well may remain unfinished. Steps are, therefore, being taken to encourage a number of the Fellows to work in the Department for two years or more and if possible to proceed towards a graduate degree.

There were 157 students in the second medical year and 169 students in the third medical year, all of whom attended the lectures and laboratory classes in Pathological Chemistry. In the teaching and laboratory work a constant aim is to discuss and to deal with such aspects of clinical chemistry and pathological physiology, which will assist the student in understanding and working out the problems which he meets with in the clinic and at the bedside.

Dr. Harold Kalant, a Senior Interne on the Medical Service of the Toronto General Hospital was appointed as a part time Demonstrator in this Department. In this dual capacity he has been able to ensure that good and interesting urine specimens were supplied for examination, along with a concise outline of the patient's history, to the students in the third medical year. It is felt that this has resulted in a marked improvement in this aspect of the teaching.

Among the graduate students, Mr. L. B. MacPherson has completed all the requirements for the Ph.D. degree; Dr. C. J. Bardawill and Mr. J. C. D. Barlow will receive their M.A. and Dr. W. K. Lindsay has finished the work for the B.Sc. (Med.) degree.

Research

Under the direction of Professor J. A. Dauphinee

Dr. Sinclair with the help of Miss Peppiatt has continued the study of the changes encountered in the serum protein fractions in the various kinds of liver disease. In addition they have studied the effect of hepatic disease upon the level of the free and combined cholesterol content of serum and also have investigated the changes in the blood phosphate and potassium which occur after the administration of glucose to patients with cirrhosis.

Dr. J. Bruce Frain has been investigating the various techniques for the estimation of amylase, lipase and trypsinogen in duodenal and pancreatic juice obtained by intubation both before and after the administration of secretin. These techniques are being applied to the study of jaundiced patients to see if occlusion of the common bile duct by stone can be distinguished from that due to carcinoma of the head of the pancreas in which presumably the pancreatic duct as well is occluded.

Mr. C. E. Downs, working with Professor R. B. Kerr and Dr. M. F. Clarkson of the Department of Therapeutics, has been following the marked changes which occur in the potassium and inorganic phosphate level of patients admitted in diabetic acidosis and coma to the wards of the Toronto General Hospital. The knowledge gained by these studies it is hoped may be of value in the treatment and management of these patients.

Dr. W. K. Lindsay, who is spending a year in this Department as part of his training in surgery, has been working under the general direction of Dr. Bigelow of the Department of Surgery and under the guidance of the staff in this Department. He has been continuing an investigation of generalized hypothermia in anaesthetized experimental animals, which has entailed the completion of the oxygen consumption studies commenced last year together with determination of fluid balance, arterial and venous pressure, cardiac output and total base changes. During the production of hypothermia there is a fall in arterial pressure and an increase in venous pressure. A progressive haemo concentration occurs during cooling and rewarming. Different methods of producing hypothermia have been investigated together with different procedures for resuscitation and rewarming.

Under the direction of Dr. T. F. Nicholson

Dr. T. F. Nicholson and Dr. P. M. O'Sullivan have been investigating the effect of various degrees of sodium depletion on kidney function in order to determine (*a*) whether or not there is a definite threshold for sodium and (*b*) whether the decrease in the rate of glomerular filtration which has been observed in sodium depletion is due entirely to the accompanying circulatory changes or whether the low sodium level has some more specific effect on the kidney.

Dr. Nicholson has been working on methods for the histochemical localization of sodium, potassium, ammonia, and inulin in tissues.

Under the direction of Professor A. G. Gornall

Dr. Gornall and Mr. J. C. D. Barlow have continued their investigations into the biochemical changes which may result from intestinal perfusion when this procedure is employed for the treatment of uraemia. A number of solutions which have been used clinically for this purpose have been studied. Most of these solutions, when used in this way, have been shown to cause serious imbalances in the electrolyte structure of the organism. However, these investigators have succeeded in developing perfusion solutions which, when used to perfuse the intestinal canal of nephrectomized dogs for several hours, not only remove considerable quantities of non-protein nitrogen, but also at the same time cause no disturbance in the normal electrolyte, acid base and water balance relationships.

Dr. Gornall and Dr. C. J. Bardawill, during the course of their investigations of the biochemical changes occurring in experimental hepatic disease, have developed an excellent colorimetric method for the determination of serum proteins.

Mrs. H. Wallace, who has taken the place of Miss M. David as Technician in the Clinical Investigation Laboratory, which is under the general direction of Dr. Gornall, has been engaged in work on several problems. In conjuction with Dr. Graham of the Department of Medicine, a study of nitrogen balance in patients with rheumatoid arthritis has been completed. She has been carrying out the biochemical determinations involved in the study, by Dr. R. M. Taylor of the Department of Medicine, of the blood glucose and pyruvic acid levels which occur after the ingestion of glucose in diabetics and in other patients. Dr. Taylor believes that such combined glucose and pyruvate curves may possibly be a more accurate test for diabetes than a glucose curve alone. She has also been applying the Majoor technique of serial precipitation of serum proteins by sodium sulphate solutions, increasing in concentration, by 1 per cent intervals, from 12 per cent to 26 per cent, and has obtained results which indicate that this may be a valuable procedure for the identification of certain characteristically abnormal types of serum.

PUBLICATIONS

GORNALL, A. G., BARDAWILL, C. J. and DAVID, M. M. "Determination of serum proteins by means of the Biuret reaction" (*Journal of Biological Chemistry,* vol. 177, 1949, pp. 751-66).

NICHOLSON, T. F. "The effect of high blood urea on the acid-base balance of serum of dogs" (*Biochemical Journal,* vol. 43, 1948, pp. 478-80).

———"Laboratory aids in the diagnosis of renal disease" (*University of Toronto Medical Journal,* vol. 26, 1949, pp. 117-32).

Pathology and Bacteriology

Under the direction of Professor William Boyd

The only change in the teaching of Pathology has been the elimination of the examination in the Third Year. This examination covers the subjects taken up in a course of lectures in the first term of the year, being the completion of the Special Pathology of the Second Year. Questions dealing with this material will be included in the Third Year papers on Medicine and Surgery. This experiment was designed to lessen the burden of examinations at the end of the Third Year. It is still only an experiment.

Some changes have been made in the course of instruction given in Bacteriology. The students' laboratory manual has been revised to provide practical exercises in immunology prior to the systematic study of the pathogenic bacteria. Procedures used in the investigation of chemotherapeutic substances and antibiotics have also been included in the practical work. The present large numbers of students precludes the demonstration of experiments to small groups. This has been overcome by close integration of the laboratory work and lectures so that those pertinent experiments that cannot be performed by individual students may be demonstrated to the class as a whole in the lecture theatre rather than to small groups in the laboratory as was done in the past.

A new course of ten lectures by Dr. P. H. Greey in Applied Bacteriology was begun in the last trimester for the final year medical students. Dr. C. E. van Rooyen and Dr. A. J. Rhodes of the School of Hygiene kindly consented to give four lectures dealing with virus infections. This is an innovation, and one which has been greatly appreciated by the final year.

The Pathology Museum was originally designed for the benefit of undergraduates, a place where they are taught to "look, and never mind what's in the book". It has gradually developed into a valuable means of self-instruction for postgraduate students, particularly men studying for the higher examinations such as those for the Royal College of Physicians and Surgeons, and Certification in the various specialties.

Dr. H. J. Barrie has been raised to the position of Assistant Professor. His teaching ability and his gift for stimulating the younger members of the staff to conduct research fully justify this promotion.

In addition to the usual teaching Fellows the following have worked in the Department in a voluntary capacity: Dr. Leo Mahoney, Dr. C. T. Chen, and Dr. S. Kiang (one year); Dr. W. A. Murray, Dr. J. R. Fowler, Dr. C. W. M. Service, Dr. J. W. Cluff, and Dr. W. H. Howell (six months). Hermant Fellows in Ophthalmology have been Dr. S. A. Solomon (Neuropathology) and Dr. M. Shusterman (Bacteriology).

In the Division of Neuropathology Dr. E. A. Linell has been appointed to the Consulting Staff of the Hospital for Sick Children. Dr. W. J. Winter has acted for a year as Fellow in Neuropathology, and Dr. J. G. Hall and Dr. S. J. Holmes, who are being trained in Psychiatry, have spent six months each as Voluntary Fellows.

Research

Reported by Professor W. Boyd

The following investigations are in progress: Dr. H. J. Barrie, malignant granuloma of the nose, diseases of the media in arteries (with Dr. L. Mahoney), unusual manifestations of silicosis (with Drs. F. G. Kergin and A. W. Carrie); Dr. D. M. Bean, multiple polyposis of the colon, glandular appendages of the bile ducts; Dr. W. G. Beattie, aplastic anaemia associated with mediastinal tumour; Dr. T. C. Brown, cirrhosis of the liver; Dr. A. W. Carrie, adenocarcinoma of oesophagus, cytology of pleural fluids (with Dr. H. Gold); Dr. I. D. Maxwell, mechanical factors in the production of emphysema; Dr. R. C. Ritchie, Stengel-Wolbach sclerosis, oil embolism following catheterization (with Dr. W. E. Ortved); Dr. H. M. M. Tovell, spontaneous rupture of intrathoracic gastric pouch.

In the division of Bacteriology a study on the value of p-aminosalicylic acid in the treatment of tuberculosis was commenced in co-operation with the staff of the Toronto Hospital, Weston. Clinical evaluation of an alternate series of cases treated with streptomycin alone and streptomycin combined with PAS indicates that the latter does not add materially to the clinical response. In the test tube, however, the inclusion of PAS in culture media prevents the tubercle bacillus from acquiring resistance to streptomycin. Bacteriological studies on a small group of patients at the Toronto Hospital suggest that this same effect occurs in humans treated with both drugs. However, a larger series of cases followed for a longer period of time must be studied before any final conclusions can be drawn. In connection with this study, Dr. H. R. Gallie has investigated chemical methods for the determination of p-aminosalicylic acid in body fluids.

In co-operation with the Department of Medicine the blood concentrations resulting from the use of various preparations of penicillin have been studied. Products prepared in oil do not give rise in some patients to a blood concentration of penicillin high enough for the initial treatment of acute pyogenic infections. Dr. H. C. Hair has continued his study of the treatment of acute gonorrhoea with streptomycin. Dr. R. C. Smith as a result of a survey has found that the constant presence of Monilia albicans in sputum is of little significance so far as a clinical diagnosis of bronchomoniliasis is concerned.

Dr. R. M. Price is continuing the work of prophylactic vaccination against tuberculosis with BCG both in children and in adults.

Dr. A. D. McKelvey, Fellow in Bacteriology, has been studying a diagnostic test for rheumatoid arthritis which depends on the ratio of the agglutination titres of the patient's serum with normal and sensitized sheep's red blood cells. Based on a study of 150 patients the test appears to be specific for rheumatoid arthritis and positive results are obtained in nearly all severe cases. In conjunction with the Department of Medicine he has studied the survival of transfused red blood cells in several cases of haemolytic anaemia. Preparations of Rh hapten made in the Banting and Best Department of Medical Research from erythrocytes, supplied through the blood bank of the Toronto General Hospital, have been assayed for activity by Dr. McKelvey.

Dr. Shusterman has worked in the Department of Bacteriology for the past year. He has conducted a study of the bacterial and viral infections of the external eye with special emphasis on the etiology of corneal ulcers. So far as we are aware, for the first time in this city a diagnosis of inclusion conjunctivitis has been proven in two patients through the demonstration of the characteristic inclusion bodies in conjunctival scrapings. In addition, Dr. Shusterman has obtained a strain of the protozoan parasite, Toxoplasma, and has propagated it in various laboratory animals. Its various properties have been studied. An antigen (Toxoplasmin) has been prepared and is being used to determine the possible presence of Toxoplasma infection

in the Toronto area through skin tests. The preliminary results indicate that toxoplasmosis occurs in this Province.

In the division of Neuropathology the following investigations are in progress: Dr. W. J. Winter, streptomycin therapy in tuberculous meningitis, arterial anomalies in the cranial cavity; Dr. J. G. Hall, changes in the brain produced by X-ray treatment.

Publications

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———"Symposium on the cytologic diagnosis of cancer" (*American Journal of Clinical Pathology,* vol. 19, April, 1949, pp. 341-3).

Donohue, W. L., Chute, A. L. and Robinson, G. C. "Cushing's syndrome in children" (*Journal of Pediatrics,* vol. 34, Jan., 1949, pp. 20-39).

McLaren, J. A. "North American blastomycosis" (*Canadian Medical Association Journal,* vol. 60, Jan., 1949, pp. 26-32).

Magner, W. "Enigmatic anaemias" (*Canadian Journal of Medical Technology,* vol. 10, Dec., 1948, pp. 181-6).

———Inaugural address, Canadian Medical Association (*Canadian Medical Association Journal,* vol. 59, Sept., 1948, pp. 284-5).

———"The national health program" (*Canadian Medical Association Journal,* vol. 60, Feb., 1949, pp. 183-6).

Ortved, W. E. and Joynt, G. H. C. "The accidental operative transplantation of benign giant cell tumor" (*Annals of Surgery,* vol. 127, June, 1948, pp. 1232-9).

Tonning, H. O. "Pneumoconiosis from Fuller's earth: Report of a case with autopsy findings" (*Journal of Industrial Hygiene and Toxicology,* vol. 31, Jan., 1949, pp. 41-5).

Wyatt, J. P. "Craniolacunia: A report of six cases with a review of the literature" (*Archives of Pathology,* vol. 45, May, 1948, pp. 667-77).

Wyatt, J. P. and Goldenberg, H. "Amniotic fluid embolism: Report of a fatal case" (*Archives of Pathology,* vol. 45, March, 1948, pp. 366-70).

———"Lower nephron nephrosis associated with massive adrenal infarction" (*American Journal of Clinical Pathology,* vol. 18, Aug., 1948, pp. 653-8).

Wyatt, J. P., Morgan, E. L. and Sutherland, R. B. "An episode of carbontetrachloride poisoning with renal complications" (*Canadian Medical Association Journal,* vol. 60, Feb., 1949, pp. 145-50).

Wyatt, J. P. and Riddell, A. C. R. "The morphology of bauxite-fume pneumoconiosis" (*American Journal of Pathology,* vol. 25, May, 1949, pp. 447-65).

Pharmacy and Pharmacology

Under the direction of Professor J. K. W. Ferguson

Courses were given in this Department to the Third Medical Year, the Second Dental Year and the Second Year in the Ontario College of Pharmacy. In addition, a course in General Pharmacology was given in the School of Graduate Studies, and a number of special lectures were given in connection with refresher courses in medical specialties.

Four candidates, all medical graduates, completed the requirements for the degree of B.Sc.(Med.).

Research

Reported by Professor J. K. W. Ferguson

Dr. J. F. Aikenhead has continued a study of local anaesthetic drugs, directing his attention particularly to conduction block. Various new and older agents have been compared for tissue toxicity and effectiveness in retro-ocular block in guinea-pigs.

Dr. R. H. Craig has participated in studies on the thyroid gland. He has studied several compounds for antithyrotropic action, and has investigated a method for measuring thyrotropic action.

Mr. L. A. O. Roadhouse has made very promising progress in studying the effects of certain war gases as repellants for rodents.

Dr. A. O. C. Smith has investigated the production of cardiac irregularities under anaesthesia with cyclopropane, and methods for their treatment.

Dr. H. W. Smith has continued his studies on the treatment of acute alcoholism. The recent announcement of a new drug, Antabuse, for the treatment of chronic alcoholism has made it imperative to experiment with this drug to determine how safe it is. Several members of the Department have interrupted their other work temporarily in order to co-operate in collecting essential information about this new drug.

Dr. G. L. McBroom has collaborated with Dr. H. W. Smith in the studies on acute alcoholism and has collected information on liver function in patients during various stages of treatment with and without Antabuse.

Dr. W. J. McCracken has ably continued the work of Dr. W. Paul and added several important improvements to the Paul oximeter. He has also continued the study of anoxia during operations on the chest.

Under the direction of Professor G. H. W. Lucas

Dr. G. H. W. Lucas has completed a study on the quantitative recovery of strychnine from the livers of animals dying from strychnine poisoning. Sufficient strychnine can be recovered from 500 grams of such livers that a quantitative biological analysis may be made on mice.

Mr. J. R. MacDougal has studied the crystal forms that can be obtained from a number of barbituric acid derivatives, using special reagents developed for this purpose. By use of such tests it is now possible to identify barbituric acid derivatives in cases of poisoning.

Dr. R. J. S. Tickle has been studying the relationships between the oxygen content of inspired and expired gas during nitrous oxide-oxygen anaesthesia in dentistry.

Miss E. J. McCree has been engaged in developing new colour tests for methadon and its derivatives, demerol and bemedone. Mr. A. G. Balmer has been engaged in developing a quantitative method for estimating methadon, using colour reactions developed for the qualitative identification of the drug.

PUBLICATIONS

BELL, R. G. and SMITH, H. W. "Preliminary report on clinical trials of antabuse" (*Canadian Medical Association Journal,* vol. 60, 1949, p. 286).

FERGUSON, J. K. W. "Antabuse" (*Canadian Medical Association Journal,* vol. 60, 1949, p. 295).

FERGUSON, J. K. W., FINLAYSON, D. M. and HILLIARD, I. M. "Oximeter measurements in pulmonary and cardiac disease" (*Federation Proceedings,* vol. 8, 1949, p. 44).

FERGUSON, J. K. W. and KERR, R. B. "The metric system and the nurse" (*Canadian Hospital,* vol. 26, 1949, p. 29; *Canadian Nurse,* vol. 45, 1949, p. 361).

FERGUSON, J. K. W. and LUCAS, G. H. W. (eds.) *Henderson's materia medica.* Toronto: University of Toronto Press. 1948.

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HUTCHEON, D. E. "Biological assay of thyroid activity" (*Journal of Pharmacology and Experimental Therapeutics,* vol. 94, 1948, p. 308).

KERGIN, F. G., BEAN, D. M. and PAUL, W. "Anoxia during intrathoracic operations" (*Journal of Thoracic Surgery,* vol. 17, no. 5, 1948, pp. 709-11).

LUCAS, G. H. W. "Color and crystal tests for the identification of methadon and isomethadon" (*Federation Proceedings,* vol. 8, 1949, p. 317).

SELLERS, E. A. "Dietary factors and hepatic injury" (*Canadian Medical Association Journal,* vol. 59, 1948, p. 403).

SMITH, H. W. and BELL, R. G. "Rate of removal of alcohol in acutely intoxicated chronic alcoholics" (*Federation Proceedings,* vol. 8, 1949, p. 333).

Physiology

Under the direction of Professor C. H. Best

The department enjoyed a vigorous year in both teaching and research. The return of Dr. E. A. Sellers as an associate professor facilitated many aspects of the work. Mr. V. B. Brooks has reviewed the biophysical part of the Course in Advanced Physiology. As a result of this evaluation and the experience of previous years this part of the course has been completely revised. Much new lecture and laboratory material has been added, giving a more complete treatment of the aspects of physiology.

The programme of meetings of the Physiological Society of the University of Toronto included some 16 presentations. We were again fortunate in having papers presented by a number of interesting visitors, among whom were Dr. A. B. Appleton from St. Thomas's Hospital Medical School, University of London; Dr. E. M. Brieger, Cambridge University; Dr. John Gaddum, Edinburgh University; Dr. J. H. Quastel, McGill University; Dr. O. G. Edholm, University of Western Ontario; Dr. Henrik Dam, Copenhagen; and Dr. P. L. Hoogland, University of Amsterdam. Not the least of the benefits arising from the visits of these scientists was the opportunity for informal discussion with them on matters of mutual interest.

The department is providing facilities for postgraduate work for students from China, India, Holland, Belgium, Austria, the United States, and from most of the provinces of Canada.

The members of the staff wish to express their most sincere appreciation to Miss Mabel Cory and to Mr. Frank Robinson, both of whom have given their complete loyalty and untiring efforts to the department's activities for many years.

Research

Reported by Professor C. H. Best

Dr. D. Y. Solandt, working with Drs. G. W. Prueter and R. J. Holden and Mr. M. L. Bunker, has carried forward the work of previous years on the genesis of the electrocardiogram, on the specific visceral effects of low environmental temperatures and on changes in kidney function in the immersion foot syndrome. The electrocardiographic investigation has led to a better understanding of the important role played by septal myocardial potentials in the production of the characteristic electrical pattern. The investigation of low environmental temperatures and of the wet-cold environmental conditions giving rise to "Immersion Foot" have led to the demonstration of visceral changes in the endocrine glands, liver and kidneys. The majority of these changes appear to be due to mild starvation resulting from low food intake during the experiment. However, renal damage, the most marked change found, is apparently not dependent on starvation. A statistically designed experiment has indicated the constant nature of this renal change and relates it to a lowering of body temperature rather than to any specific effect associated with the "Immersion Foot" phenomenon.

Dr. R. E. Haist with Mrs. M. A. Evans, Mr. B. Kinash, Dr. M. A. Ashworth and Mr. N. C. Kerbel has been studying the effect of various factors on the growth and structure of the islets of Langerhans. Quantitative data concerning islet volume have been obtained using a method developed previously by Dr. Haist and Mrs. E. J. Pugh. It has been found that islet growth in rats is increased by the injection of certain pituitary extracts, by the administration of thyroid materials and by the continuous intravenous injection of glucose. The latter will cause the islet volume to be doubled within ten days in young rats. Islet growth was found to be retarded in young growing rats by the daily injection of large amounts of insulin and also by undernutrition. With Mr. J. S. Speakman an attempt is being made to obtain a method for the assay of adrenocorticotrophic material in urine. As part of an investigation of the relationship between the function of certain endocrine and exocrine glands, a method for secretin assay is being developed with Mr. J. E. C.

Dorchester, and with Dr. J. L. Barrett a study of certain pancreatic enzymes has been undertaken. Dr. Ashworth has improved his procedure for the measurement of blood flow in tissues and is now able to record the flow automatically and simultaneously in five different tissue regions.

Dr. E. A. Sellers has collaborated with Professor J. K. W. Ferguson (Department of Pharmacology) in studying the long-term effects of continuous administration of propylthiouracil in rats receiving normal and hypolipotropic diets. An interesting effect observed is the development of exophthalmos in these animals.

The main efforts of Dr. Sellers' group are directed to studying the effects of a cold environment on nutritional requirements and metabolic changes. To this end, a cold room has been constructed in the Department. The effects of a cold environment on thyroid function and on thyrotropin production have been investigated. While metabolic rate goes up immediately on exposure to cold, increased production of thyroid hormone and thyrotropin takes place slowly over a number of weeks. Even this slow increase appears to be of limited duration and production falls off with prolonged exposure. Dr. Rosemary You has studied the effects of injury, of administration of thyroid and of cold on nitrogen balance. Dr. S. S. You has found that the administration of desoxycorticosterone acetate for several days before a burn ordinarily lethal affords considerable protection both in adrenalectomized and in normal animals.

Dr. J. Markowitz, working with Drs. A. Rappaport and A. C. Scott, found evidence of a hitherto unrecognized function of the hepatic artery in dogs. This investigation has extended over a number of years. Briefly, it may be said that the liver of dogs normally houses anaerobic bacilli, which proliferate when the oxygen tension of the organ falls, inducing total massive gas gangrene of the organ. It is apparently a function of the hepatic artery to keep the O_2 tension sufficiently high to inhibit this proliferation. When the artery is effectively tied and penicillin given for some days, the animals uniformly recover, although the liver now is supplied only by the portal vein. Dr. Rappaport has worked out a new technique for employing the auricular appendage of dogs in the fashioning of a new auriculoventricular valve. This appears to be a distinct step forward in experimental surgery. Dr. Scott is studying the secretory capacity of the fundic part of the dog's stomach after excising the pyloric antrum, leaving intact, however, the artery along the greater and lesser curvature.

Dr. E. Fidlar, collaborating with Dr. L. B. Jaques, has published the results of the investigation of heparin mentioned in last year's report. The effect of storage on the platelet agglutinating property of heparin is being followed. A new sample has shown no significant change after six months. The effect of injection of other materials preceding the heparin is also being examined.

Dr. J. Campbell, with the assistance of Mr. I. W. F. Davidson, studied the metabolism of the livers of rats treated with an anterior pituitary extract which causes fat mobilization and increased fat utilization. Slices of liver from the treated animals showed a considerable increase in metabolic activity associated with an increased production of acetoacetate. Mr. W. D. Snair prepared crystalline growth hormone, highly purified adrenocorticotrophic hormone, a fat-mobilizing fraction and a diabetogenic fraction of the anterior pituitary gland. With Dr. H. P. Lei these active extracts are being tested for their physiological activities. Dr. Lei has studied the fat mobilization produced by the administration of carbon tetrachloride and has found that hypophysectomy reduces, but does not completely abolish this effect. Miss D. H. Stock has developed a method for the determination of small amounts of fat in tissues. The rate of respiration of adipose tissue has been determined, and attempts have been made to relate this to the transfer of lipid into and out of the cells. A highly efficient macerator which has proved useful in the analysis of tissues has been devised by the laboratory personnel.

Dr. E. S. Goranson, with Mr. S. D. Erulkar, has continued investigations on the relationship of insulin to oxidative phosphorylations. An effect of insulin was demonstrated, *in vivo* and *in vitro,* on the efficiency of coupling of oxidation and

phosphorylation in tissue preparations from the rat in the presence of succinate or malate. Miss E. F. Purdie, working with Dr. Goranson, found no significant difference in the muscle hexokinase activity of normal and alloxan-diabetic rats.

With Dr. Knud Lundbaek, in the Department of Medical Physiology, University of Copenhagen, Dr. Goranson obtained evidence of an increased phosphorylase activity in the resting muscle of starved rats compared with fed controls indicative of a reduced activity of the prosthetic-group removing (PR) enzyme. Mrs. N. M. Danoff, under Dr. Goranson's direction, has carried out kinetic studies on the phosphorylase system and has investigated the reversal of phosphorylase activity following re-feeding of the starved animals with isocaloric fat and carbohydrate diets.

Publications

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Jaques, L. B. and Ricker, A. G. "The relationship between heparin dosage and clotting time" (*Blood,* vol. 3, 1948, pp. 1197-1212).

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Psychiatry

Under the direction of Professor Aldwyn Stokes

Over the past year some progress has been made in augmenting the calibre of the teaching staff of the Department of Psychiatry, and of broadening the clinical scope of the Department's activities. Two circumstances have contributed to this development. First, training grants have been made available to the Department by a Provincial allocation of Federal Funds; secondly, close associations have been made with other Departments of the Medical Faculty, and with other Faculties of the University to the benefit of Psychiatry.

The Mental Health Grant. The Provincial Government allocation of its Mental Health Grant to the Department of Psychiatry was to the amount of $82,000 for the academic year. Owing to delay in authorization, organization under the grant was not possible until towards the end of 1948. Nonetheless a number of senior appointments were made particularly in Forensic Psychiatry, Sociology and Psychiatric Social Work. An impetus has been given to Biochemical research by the appointment of a research Fellow and a visiting Professor. Training Fellowships under the grants have been awarded in Psychiatry and in Psychiatric Nursing.

Associations with other Departments and Faculties. The Department of Medicine has developed a Psychiatric Unit at the Wellesley Hospital which will be available for postgraduate psychiatric training. Similarly the D.V.A. Department of Medicine has made the Neuropsychiatric Unit of Sunnybrook Hospital available for a similar purpose. Two such clinical fields will play an outstanding role in the integration of

medical and psychiatric concepts, in the development of psychosomatic problems, and in offering an experience to postgraduate students of those less florid forms of psychiatric illness met with in general hospital practice.

The Department of Paediatrics has made its clinic in psychological medicine available for postgraduate psychiatric training. This extension of training facilities will allow a focussing on the problems of functional illness in children.

The Department of Pathology has cemented an already close working relationship by extended provisions for the study of Neuropathology.

Further liaisons have been made which should allow a steady growth on a firm clinical basis of the psychiatric aspects of clinical psychology, social work, nursing, child development and industrial relations. In addition two fields, outside the University, have been added to the Psychiatric training programme. They are the Family and Children's Court, and the Forest Hill Village School system. Both are potentially first class opportunities for patient, worthwhile research into problems of Mental Health.

Postgraduate education. With the augmenting of teaching strength and the broadening of clinical scope a four year plan of postgraduate training to specialist status has proceeded. Admission to the training programme is now "open" and includes not only members of the Ontario Hospital Service but also any graduate of proper calibre who is seeking to make psychiatry his medical vocation. Enrolment has been shifted to July 1st and January 1st. Whereas numbers have increased from 5 in 1946 to 7 in 1947, to 11 in 1948, to 18 in 1949, the quality of postgraduate seeking training requires raising: there is an indication that the quality of trainee is improving.

In 1948 5 out of 7 candidates obtained the Diploma in Psychiatry: 2 obtained the Specialist Certificate in Psychiatry of the Royal College. Dr. D. Ewen Cameron, Professor of Psychiatry, McGill University, has been appointed external examiner.

Undergraduate education. The objectives of undergraduate teaching have remained as a working appreciation of the mental aspects of illness and the promotion of a practical therapeutic approach. The difficulties of dealing with large groups of students have not yet been surmounted to the end of giving each student a personal clinical experience. Nonetheless, all teaching has been around patients with the free illustration of case problems.

Education in ancillary fields. The Department has continued to exert an active educational function in the ancillary fields of nursing, occupational therapy, social work, clinical psychology and education. The programmes have been essentially practical in nature and have been augmented over the last year to make up a rich experience.

Administrative. The Academic Council has continued to exert a powerful guiding influence on the Department's growth. A close relationship has been maintained between the Council and the President's Standing Committee on the Mental Health Programme. The Standing Committee in its turn has a fostering relationship to the Working Committee of the Forest Hill Village Project. With the likelihood of a more permanent status to the Mental Health grants these loose relationships will require some clarification and tightening of bonds.

The Provincial Department of Health has agreed to the seconding of its personnel (on full remuneration) for training. This arrangement asserts the principle that men entering the postgraduate course are completely under the aegis of the University.

The complicated relationships between Hospital and University will not be completely disentangled until a Board of Governors to the Hospital as a teaching unit is established.

University Health Service: The Department of Psychiatry has developed its relationship to the University Health Service. Free use of its consultation and treatment facilities has been made and a winter programme of Education in Mental Health has been carried out.

Graduate Bursary Fund: The Medical Alumni Association has received additions to its Graduate Bursary Fund in Psychiatry which will be used as circumstances permit to aid postgraduate physicians in the completion of their training.

Library: Considerable additions have been made to the Hospital library by funds made available from the Provincial Government.

Equipment: Technical equipment has been supplied on a more satisfactory basis.

Conclusions. Many defects still exist in the work and organization of the Department of Psychiatry. In particular a strengthening is necessary in the fields of Psychopathology and Child Psychiatry for the purpose of a balanced all round programme. Facilities in many instances are outmoded and outgrown: in particular, good outpatient premises are an immediate necessity. Research encouragement remains as an urgent need. Nonetheless, worthwhile progress has been made under the influence of a concerted effort by the department's staff and the fostering spirit of the Medical Faculty.

Research

Reported by Professor A. B. Stokes

During the current academic year a beginning has been made in the development of research projects.

Dr. L. Gjessing has laid the groundwork for a biochemical and physiological investigation into the problems of periodic catatonia. The organization of a day by day investigation of one or two carefully selected patients over many months has proceeded. Dr. J. E. Goodwin has carried on his neurophysiological studies in the clinical significance of alpha variants found in electroencephalographic records. Dr. W. B. Spaulding has used the theramatic apperception test and the electromyograph in an inquiry concerning the relationship between slight degrees of emotional tension and slight degrees of muscle activity. Mrs. M. R. King has pursued an investigation of individual differences in characteristic feeling tone as indicated by a newly devised projective technique. Mr. D. S. MacDonald has undertaken the problem of investigating personality associations of abnormal cortical activity. His method involves the comparison of Rorschach test findings with abnormal EEG records. Mr. G. G. Elliott is investigating the performance of patients in block design constructions of increasing complexity. Mr. J. Seeley has embarked on a sociological survey of a small Toronto community with a view to isolating those factors impinging on children to the detriment of mental health.

Items of clinical inquiry have been taken up by the working staff. Dr. T. A. Sweet has interested himself in the clinical aspects of pathological lying. A further investigation has proceeded of schizophrenic patients subjected to insulin shock therapy and showing abnormally low blood sugars without deep coma. Dr. G. C. Beacock and Dr. A. Miller have continued an investigation into the clinical criteria associated with good prognosis in a group of patients submitted to prefrontal leucotomy (in association with the Department of Neurosurgery). Dr. J. S. Pratten has reported on two cases of pemphigus associated with florid mental disorder.

Publications

Farrar, C. B. "Benjamin Rush, complete physician: The father of American psychiatry" (*Canadian Hospital,* vol. 26, 1949, pp. 39-40).

———"Psychiatry"; in *The 1949 new international year book,* pp. 445-58. New York: Funk & Wagnalls. 1949.

Gray, K. G. "Legal problems in industrial medicine" (*Canadian Medical Association Journal,* vol. 60, 1949, pp. 447-9).

Gray, K. G., Stokes, A. B. *et al.* "A symposium on the termination of pregnancy" (*University of Toronto Medical Journal,* vol. 26, no. 6, 1949, pp. 215-32).

Seeley, J. "The psychology of criticism and the criticism of psychologists" (*Canadian Journal of Psychology,* vol. 2, no. 4, 1948, pp. 198-205).

———*Some sources of hostility in modern society.* Montreal: McGill University. Nov. 17, 1948. Mimeographed.
STOKES, A. B. "Eugenic aspects of social psychiatry"; in *Papers given at a meeting of the Ontario Neuropsychiatric Association,* Sept. 10, 1948. Toronto: Department of Health.
———"Old age from the psychiatric viewpoint" (*Canadian Medical Association Journal,* vol. 59, 1948, pp. 518-21).

Radiology

Under the direction of Professor A. C. Singleton

The death of Professor G. E. Richards on January 13th, 1949, the first Professor of Radiology of the University of Toronto and Head of the Department of Radiology of this University since its inception, is recorded with profound regret. Dr. Arthur C. Singleton was appointed Acting Head of the Department for the remainder of the session.

With the beginning of the present university year, the staff of the Department of Radiology of the Faculty was greatly enlarged. Dr. E. H. Shannon of St. Michael's Hospital, Dr. W. C. Kruger of the Toronto Western Hospital, Dr. J. D. Munn of the Hospital for Sick Children and Dr. D. T. Burke of Sunnybrook Hospital were appointed Associates in Radiology, thus bringing the X-ray Departments of these four hospitals within the University sphere and making these men available as teachers and their departments available for study, both undergraduate and post-graduate. The benefits to be derived from these associations are very great. The teaching of Clinical Radiology to the Fourth Year Medicine, to students on Surgery, which previously had been done only in the Toronto General Hospital, has now been extended to St. Michael's and Western Hospitals. It is anticipated that, with our augmented staff, the clinical teaching of Radiology to undergraduate students will be further extended. We record the promotion of Drs. C. L. Ash and Vera Peters to the rank of Associates in Radiology and the appointment of Dr. D. G. Wollin to the rank of Clinical Teacher. Dr. Owen B. Millar, who has been studying radiation therapy of cancer in Britain and Europe for a year, returned to the Department in February.

The didactic teaching in the course for the Diploma of Radiology has been greatly improved. This has been accomplished by our augmented staff in the Department, as outlined above, and through the courtesy of Professor J. C. B. Grant and Professor William Boyd in arranging for the teaching of Anatomy and Pathology to our Diploma students.

The staff of the Department took part in the teaching of the Advanced Post-graduate Courses in Medicine, Surgery, Obstetrics and Gynaecology, and in the Refresher Courses in Ophthalmology and Otolaryngology.

RESEARCH

Reported by Professor A. C. Singleton

Research work in the Department of Radiology has been, for the most part, joint research with members of other departments.

Dr. A. C. Singleton has been collaborating with Dr. R. C. Dickson of the Department of Medicine in an investigation of long-term changes in Crohn's disease, and with Dr. J. Markowitz of the Department of Physiology in the study of hepatic insufficiency following surgical interference with the blood supply of the liver.

Dr. M. R. Hall has been collaborating with Dr. R. B. Kerr of the Department of Medicine and with the Sick Children's Hospital staff in an investigation of degenerative changes in long-standing cases of diabetes.

Dr. K. F. MacEwen has been collaborating with Dr. G. L. Watt of the Department of Obstetrics and Gynaecology in a study of the accuracy of various methods of pelvicephalometry.

Dr. Vera Peters, in conjunction with Dr. Anathalie Heath, Professor W. R. Franks and Dr. W. F. Hartroft, has been continuing a research begun last year on the influence of radiation of the thymus gland on the incidence of leukaemia in a high leukaemic strain of mice.

Dr. J. D. Munn has been carrying out a number of research projects at the Hospital for Sick Children in conjunction with the Department of Paediatrics. These consist of the investigation of lung changes in pancreatic fibrosis, the investigation of mediastinal shadows in children and a study of congenital anomalies of the upper cervical spine.

Dr. D. T. Burke has been carrying on research in X-ray densities and X-ray planigraphy.

Publications

Burke, D. T. and Goldberg, L. "The azygos vein in tomography" (*Canadian Medical Association Journal,* March, 1949).

Surgery

Under the direction of Professor R. M. Janes

No major changes in the teaching programme have been made during the past year. The attempt to co-ordinate the teaching in order that the student may be assured of a reasonably complete coverage of what an undergraduate should learn about surgery has been continued. It is felt that a real improvement has been made in the teaching of the basic sciences of Anatomy, Physiology and Pathology in their relation to surgery. Despite the excellent training that our students now receive in basic science departments, the clinician is not relieved of responsibility for training the student to apply the fundamental knowledge that he has gained to clinical problems. The young men now joining the staff of the department have had the kind of training that makes it possible for them to bridge the gap that can so easily exist between the pre-clinical and clinical years.

The encouragement of a closer relationship between the teaching hospitals has continued. The head of the department has enjoyed the privilege of making monthly rounds with Dr. Keith Welsh and the surgical staff of St. Michael's Hospital and Dr. Robert Laird and the surgical staff of the Toronto Western Hospital, and is appreciative of the opportunity which these occasions afford for personal contact and for observation of the work that is being done. Joint rounds have been held once a month by the members of the division of Urology of these hospitals under the direction of Dr. J. C. McClelland. It is felt that they provide valuable personal contacts as well as opportunities for the exchange of ideas.

Joint meetings with the staffs of other departments have continued. The weekly conference on chest problems inaugurated a few years ago for which responsibility is assumed by the departments of Medicine and Surgery on alternate weeks, have maintained their popularity. They are also participated in by the departments of Radiology, of Otolarnygology and of Pathology. The regular attendance and assistance of the members of the staff of the Toronto Hospital for Tuberculosis has added to the value of the conferences. Visitors have been welcomed and are nearly always numerous. Their interest is also appreciated. Similar joint conferences on problems of common interest to the neurologist, psychiatrist and neurosurgeon have been inaugurated and are proving valuable. The surgical pathological conferences conducted by Professor Wm. Boyd and his staff on the fourth Wednesday of each month and attended by the visiting and resident staffs of the hospitals, have been continued as well as the monthly conferences on orthopaedic material. These presentations are always stimulating and are much appreciated by the Department of Surgery. At the regular staff meeting of the General Hospital held on Thursday, March third, the programme was provided by Professor Charles Best and the

members of the Department of Physiology and The Banting and Best Department of Medical Research. A series of presentations of investigations of interest proved most stimulating to physiologists and to surgeons.

The most important postgraduate activity within the department continues to be the graduate course in surgery initiated by Dr. Gallie. The joint participation of the Toronto General, St. Michael's, Western, Hospital for Sick Children and Sunnybrook Hospitals and the Toronto Hospital for Tuberculosis is working well. Applications for admission to the course are considered by a committee representing the staffs of all these hospitals. This committee also advises the head of the department regarding the work being done by those in the course and the assigning of them so that each man may receive a well-rounded training. Assistance from the Toronto East General, The Hamilton General and The Mountain Sanitorium is appreciated. Facilities for training in Physiology are being provided by Professor Best and in Anatomy by Professor Grant.

Nearly all prospective appointees now spend one year as fellows in one of the basic science departments. This year Doctor A. C. Scott was assigned to Physiology, Drs. W. K. Lindsay and M. A. Flock to Pathological Chemistry, Dr. W. J. McCracken to Pharmacology, Dr. K. A. Brown to The Banting and Best Department of Medical Research with Dr. Franks and Dr. G. E. Robinson to Anatomy. In many instances these men engage in a research problem with a member of the surgical staff in close association with the head of the department to which they are attached. The head of each of these departments provides an opportunity for the acquisition of a basic training in his subject. This interest is gratefully acknowledged. Those who continue the training in surgery are able to apply this year in a basic science to the requirements for Fellowship in the Royal College of Surgeons of Canada.

The following former members of this course were successful in passing the examinations of the Royal College of Surgeons of Canada: Drs. N. C. Delarue, I. B. Macdonald, J. L. Russell, W. F. Wales, and T. S. Wilson.

The advanced refresher course in surgery which is largely attended by men seeking fellowship in or certification by the Royal College was repeated in September and October, 1948, with a full attendance. Perhaps the fact that applications for admission to the course this autumn are much more numerous than can be accepted may be taken as evidence of its popularity.

There have been repeated requests from surgeons living within driving distance of Toronto for greater contact with clinical surgery in the teaching hospitals. In an attempt to meet this need during the next session, each of the teaching hospitals and Sunnybrook have undertaken to provide a clinical programme on the afternoon of one of the regular meetings of the surgical section of the Academy of Medicine. They will then be able to attend the Academy meeting in the evening.

Dr. Carl Aberhart became a member of the American Society of Genito-Urinary Surgeons. Dr. Edouard Gagnon was admitted to membership in the American Association for Thoracic Surgery. Drs. W. G. Bigelow, Ian B. Macdonald, N. C. Delarue and W. T. Mustard have met the requirements for the M. S. degree. Dr. Bigelow's thesis was on "Hypothermia, Oxygen Consumption, Transport and Utilization in Dogs at Low Body Temperatures"; Dr. Delarue's on "Fundamental Principles in the Pathology, Diagnosis and Treatment of Acute Closed Head Injuries"; Dr. Mustard's on "The Morphology and Pathogenesis of Idiopathic Scoliosis"; and Dr. Macdonald's, "Anterior Rhizotomy". The Lister Prize was divided between Doctors Bigelow and Mustard.

Travelling fellowships have been held during the year by Dr. R. A. Mustard who has spent three months with Dr. Clarence Craaford in Stockholm and the remainder of the time in Great Britain. Dr. Joynt has visited a number of surgical clinics in the United States, paying particular attention to thoracic surgery; Dr. Russell has visited various urological clinics in the United States. Dr. MacIntosh has held a Nuffield Scholarship which has enabled him to spend a year in orthopaedic clinics in the United Kingdom. Dr. Russell has joined the Division of Urology at

the Toronto General Hospital. Dr. Mustard will return on July 1st to an appointment in general surgery at the Toronto General, and Dr. MacIntosh in October to the Orthopaedic Division in the General Hospital. Dr. F. P. Dewar was chosen as one of the Canadians to visit Great Britain as a guest of the British Orthopaedic Society. He has had a most stimulating experience.

The 1948 Donald G. Balfour lecture was delivered on April 26, 1949, by Dr. Waltman Walters, his subject being "Twenty-five Years of Biliary Tract Surgery". His address was much appreciated. Dr. Clarence Craaford of Stockholm, Sweden, was to have delivered the 1948 lecture on Wednesday, November 10, 1948, but he was unable to be present because of illness. It is hoped that he may be able to accept an invitation on some future date.

Honorary Fellowship in the Royal College of Surgeons of England was conferred upon Doctor R. I. Harris on April 29, 1949, following which he delivered a Hunterian Lecture on "Spondylolithesis". On April 25, 1949, Doctor W. E. Gallie delivered the Trimble Lecture in Baltimore at the Sesquicentennial Celebration of the Medical & Chirurgical Faculty of the State of Maryland. His subject was "Preparation for License to Practise".

At the annual convocation on June 17, 1949, an LL.D was conferred upon Doctor Gallie by his Alma Mater in recognition of his outstanding contributions to the university as Dean of Medicine and Professor of Surgery. Following this, Doctor Gallie addressed convocation.

Dr. K. G. McKenzie has been president of the Senior American Neurosurgical Association during 1948.

Doctor J. C. McClelland, having reached the university age of retirement has resigned from the positions of Associate Professor of Surgery and Head of the division of Urology in the General Hospital. During the time that Dr. McClelland has been head of this division, he has done much to co-ordinate the work of the department of urology in the university hospitals. His loyal co-operation in the activities of the department of surgery and his services as a teacher will be much missed.

Miss Tanis MacLaren, who has been secretary to the department for so many years, has resigned to undertake new responsibilities. Miss MacLaren has had an important place in the department and, while expressing regret at her leaving, we wish her good luck. The new secretary will be Miss Elizabeth MacRae.

Research

Reported by Professor R. M. Janes

A considerable amount of research has been under way in the Department during the past year. It will not be possible to increase the work on animals much more until greater facilities are provided.

The following investigations have been undertaken:

Bigelow, W. G. Metabolism, biochemistry and factors influencing survival in generalized hypothermia (dogs); the relationship between intravascular agglutination, vascular stasis (sludged blood), and sedimentation rate in trauma (rabbits and dogs; cinephotomicrographic study); a clinical study of blood volume changes in chronic surgical conditions; a clinical study of etiology of chronic leg ulcers.

Botterell, E. H. Continuing study of cerebral tumours, cerebro-vascular malformations and intracranial aneurysms in collaboration with Dr. Wollin of X-Ray Department by means of carotid arteriography; continuing study of reflex muscular spasm and pain of central origin in paraplegia; a short-term follow-up study of the results of disc surgery at Sunnybrook Hospital; participation with Dr. K. G. McKenzie in a joint study with the Department of Psychiatry of the problems of prefrontal lobotomy.

Delarue, N. C. Clinical analysis: bronchial adenoma; follow-up, bronchogenic carcinoma (not completed).

Gordon, S. Isoplastic transplantation of bone to muscle and bone; isoplastic transplantation of cartilage to bone; further study of the effect of hyaluronidase in free skin grafts.

HARRIS, R. I. Continuation of tourniquet project; study of end results of fracture of the neck of the femur; airborne infections in the operating room.

KERGIN, F. G. Further investigation of anoxia during thoracic operations in co-operation with the Department of Pharmacology; clinical investigation of bronchiectasis with special reference to bilateral disease.

ROOME, N. W. Investigation of the cutting and coagulating effects of high frequency electric currents of various forms; clinical survey of 500 cases following transurethral operations.

MCKENZIE, K. G. Clinical follow-up of results of Smithwick operation with Drs. Stock and Murnaghan.

ROBERTSON, H. F. Investigations into the development of a clinically useful plethysmograph for the study of vascular diseases; clinical review of results of treatment in Buerger's disease and arteriosclerosis.

RUSSELL, J. L. Investigations into lymphatic drainage of the urinary bladder as related to operations for carinoma of this organ.

TOVEE, E. B. Research on closed loop obstruction in dogs, using sulphadiazine, penicillin, streptomycin and furacin; clinical research on perforated peptic ulcers.

PUBLICATIONS

ABERHART, C. "A modified 'T' tube for use in surgical repair of ureteral lesions" (*Journal of Urology,* vol. 60, Nov., 1948, pp. 790-1).

———"A new disposable rubber urinal for males" (*Journal of Urology,* vol. 61, no. 2, Feb., 1949, p. 470).

ALEXANDER, E. and JANES, R. M. "Neurofibroma: Benign intraspinal-intrathoracic 'hourglass' tumour with paraplegia" (*Annals of Surgery,* vol. 129, no. 2, Feb., 1949, pp. 267-73).

BOTTERELL, E. H. and DENNY-BROWN, D. "The motor functions of the agranular frontal cortex: The frontal lobes" (*Proceedings of the Association for Research in Nervous and Mental Disease,* vol. 27, 1947, pp. 235-345).

DELARUE, N. C. and GRAHAM, E. "Alveolar cell carcinoma of the lung (pulmonary adenomatus Jazzickti?): A multicentric tumour of epithelial origin" (*Journal of Thoracic Surgery,* vol. 18, April, 1949, pp. 237-51).

DUCKWORTH, D. A. "Rare renal ruptures" (*Canadian Medical Association Journal,* vol. 60, no. 5, May, 1949, pp. 500-3).

GORDON, S. D. "The subcutaneous transplantation of skin" (*British Journal of Plastic Surgery,* vol. 1, no. 3, pp. 1-66).

GRAY, J. "Evaluation of conservative resection with end-to-end anastomosis for carcinoma of the rectum and lower sigmoid colon" (*Archives of Surgery,* vol. 57, Sept., 1948, pp. 361-72).

HARRIS, R. I. "Etiology of peroneal spastic flat foot" (*Journal of Bone and Joint Surgery,* British number, vol. 30B, no. 4, Nov., 1948, pp. 624-34).

———"The future of orthopaedic surgery." President's address, American Orthopaedic Association (*Journal of Bone and Joint Surgery,* vol. 30A, no. 4, Oct., 1948, pp. 805-10, 847).

KEITH, W. S. "Subdural empyema" (*Journal of Neurosurgery,* March, 1949, pp. 127-39).

KERGIN, F. G., BEAN, D. M. and PAUL, W. "Anoxia during intrathoracic operations" (*Journal of Thoracic Surgery,* vol. 17, no. 5, 1948, pp. 709-11).

LEMESURIER, A. B. "Developmental coxa vara" (*Journal of Bone and Joint Surgery,* British number, vol. 30B, no. 4, Nov., 1948, pp. 595-605).

———"A method of cutting and suturing the lip in the treatment of unilateral cleft" (*Americal Journal of Plastic and Reconstructive Surgery,* vol. 4, no. 1, pp. 1-12).

ROOME, N. W. and FRANCIS, R. R. "Effect of carbackol and meckolyl on the urinary bladder" (*Journal of Urology,* vol. 60, no. 2, Aug., 1948, pp. 290-6).

RUSSELL, J. L. "A method of excision and primary closure of pilonidal cysts and sinuses" (*Canadian Medical Association Journal,* vol. 60, March, 1949, pp. 267-70).

THOMSON, S. "Treatment of congenital club foot" (*Journal of Bone and Joint Surgery,* vol. 31A, no. 2, April, 1949, pp. 431-4).

Therapeutics

Under the direction of Professor R. B. Kerr

There has been no change in the method of teaching in the Department from the previous year.

It is with regret that the retirement of Dr. C. E. Cooper Cole occurs at the end of this session. He has been associated with the teaching of Therapeutics for many

years and has contributed much to the teaching of the subject especially from the standpoint of handling common situations in a medical practice.

Dr. M. F. Clarkson has held the Research Fellowship in Therapeutics for this session.

Dr. T. W. Clarke, Dr. H. Kalant, and Dr. G. A. Low were appointed as Assistants in Therapeutics for the session.

Anaesthesia. The teaching of Anaesthesia has followed the same plan as in previous years.

The retirement of Dr. C. H. Robson from his appointment as Clinical Teacher in Anaesthesia occurs at the end of this session. The Department regrets that Dr. Robson is retiring after a long period of teaching Anaesthesia at the Hospital for Sick Children.

Dr. W. H. Butt, Dr. R. H. Meredith and Dr. J. A. Vining were appointed as Clinical Teachers in Anaesthesia.

Dr. L. A. Stubensey, Dr. H. E. Robinson and Dr. H. W. Boyes were appointed as Voluntary Assistants in Anaesthesia.

Physical Therapy. No change has been made in the teaching of this subject to the undergraduate students.

Miss D. C. Madgett has been appointed as Assistant in Physical Therapy.

Research

Reported by Professor R. B. Kerr

Dr. M. F. Clarkson with Dr. R. B. Kerr has studied the changes in electrolytes in cases of diabetic acidosis and coma before and during treatment. This work has been carried out in conjunction with Professor J. A. Dauphinee of the Department of Pathological Chemistry. A marked decrease in the serum potassium and serum phosphate level has been observed during the recovery period after diabetic acidosis. In spite of low serum potassium values no case of the muscular weakness described by other investigators has been observed.

Dr. A. H. Squires has continued his studies on prolonged administration of thyroid extract to normal and obese individuals and the effects after withdrawal of the drug, from the standpoint of the B.M.R., serum cholesterol, and serum protein bound iodine. This work is being done in co-operation with Dr. M. W. Johnson of the Department of Medicine.

In the sub-department of Anaesthesia Dr. Code Smith has worked in the Department of Pharmacy and Pharmacology under the direction of Professor Ferguson. The investigation has been a study of cardiac arrhythmias in cyclopropane anaesthesia.

Publications

Brown, W. E. "Some suggestions for the conduct of continuous spinal anaesthesia" (*Anaesthesiology,* vol. 10, 1949, pp. 193-201).

Butt, W. A. and Boyes, H. W. "Anaesthesia for bronchoscopy and oesophagoscopy" (*Canadian Medical Association Journal,* vol. 60, 1949, pp. 62-4).

Gordon, R. A. "The application of nerve block in diagnosis and therapy" (*Canadian Medical Association Journal,* vol. 60, 1949, pp. 251-7).

———"Intravenous procaine: Clinical applications" (*Canadian Medical Association Journal,* vol. 59, 1948, pp. 534-5).

Banting and Best Department of Medical Research

Under the direction of Professor C. H. Best

One of the main researches during the past year has been the extension of previous studies of the dietary factors which protect the liver and kidneys. Professor C. C. Lucas has devised basal diets for a systematic examination in young male rats of the quantitative interrelationships between the requirements for dietary

methionine, amino acid sulphur and choline. Values for the first two have been established; the choline requirement is being determined. Dr. Lucas and Dr. Jessie H. Ridout have been continuing their efforts to improve the methods used for quantitative determination of tissue lipids, particularly phospholipids. Dr. Ridout has devoted considerable time to close supervision of feeding of several hundred young rats being raised on a hypolipotropic diet to study its effect upon the incidence of neoplasms. Daily examination of these animals is necessary for several months; frequent adjustment of the very limited choline intake must be made until the rats are past the susceptible age, in order to avoid death due to kidney damage. Dr. Lucas, Dr. Ridout and Dr. Jean M. Patterson have assisted the Director of the Department and Professor W. S. Hartroft in a study of the role of alcohol in the production of liver damage (fatty infiltration followed by cirrhosis). Several hundred routine tissue lipid determinations for other members of the Department have been made by Drs. Ridout and Patterson, with the technical assistance of Mr. Murray Emmons.

Professor C. S. McArthur has continued his studies of methods of separation of pure individual sphingolipids, rates of hydrolysis of these, and isolation, purification and investigation of sphingosine from the hydrolysates. The acute toxicity of the tri-ethyl homologue of choline has been determined and further data on its chronic toxicity and lipotropic activity have been obtained. This work has been supported by The Nutrition Foundation of New York.

Dr. McArthur, with Dr. C. A. Vuylsteke of Louvain, Belgium, has been studying the possibility of isolating Rh antigens from human blood cells discarded (because of age) from the blood banks of local hospitals. Dr. McArthur has also devoted some time to assisting Dr. N. Kalant and Dr. H. R. Gallie (of the Department of Bacteriology) with the biochemical aspects of their clinical investigations.

Mr. L. B. Macpherson has effected some further concentration of the phosphoinositide in rat (and pig) liver, but the product so far has defied isolation in pure form. The best fractions were hydrolyzed and separated with the help of ion exchange resins into acidic, basic and neutral components. Free inositol and inositol monophosphoric ester have been isolated but no diphosphoric ester could be detected. This work also has been supported by The Nutrition Foundation of New York.

Dr. W. J. Linghorne and Mr. D. C. O'Connell have made excellent progress in their dental researches. Mr. O'Connell has spent several weeks with Dr. T. H. Rosebury in New York and this collaboration is certain to facilitate the dental bacteriological work in Toronto. The work on reattachment of soft tissue to teeth is also most promising. This work has been supported by the National Research Council through the Associate Committee on Dentistry.

In the section of Histopathology, under Dr. Hartroft, microsections to the number of approximately 8,000 have been cut. These have been stained by a variety of methods. This work has been performed for members of all sections of this Department and also the Department of Physiology. The experiments started last year, to investigate the possibility of producing hypertension by dietary deficiency alone, were concluded and a paper describing the results was published in the *British Medical Journal* by Hartroft and Best. Weanling rats which survived brief periods (5 to 6 days) of dietary choline deficiency were then fed full diets until they attained maturity. All animals which had suffered *severe* degrees of renal damage at the time of the dietary deficiency of choline developed a sustained hypertension after four to seven months. It is planned to extend these investigations to older animals during the coming year. In addition, Dr. Hartroft completed a series of investigations concerning the pathogenesis of cirrhosis in rats fed diets low in choline for periods up to seven months.

Dr. A. R. Colwell, Jr., working in Dr. Hartroft's section, has studied the role of bile in the intestinal absorption of fat. He has developed techniques for the construction of an artificial gall bladder in the rat, which normally does not possess this organ. In addition he is able to anastomose the bile duct with the vas deferens, thus permitting the escape of bile into the urine, and excluding bile from the gastro-

intestinal tract. Similar techniques for the construction of pancreatic fistulae and collection of the external secretion of the pancreas have been developed by Dr. Colwell, using the rat. He has also assisted Dr. D. Fraser, Jr., in studies of liver function in dogs following hepatic artery-ligation and the administration of penicillin according to the technique of Dr. J. Markowitz.

Mr. R. R. Tasker has worked with Dr. Hartroft in investigations concerning the alleged action of choline in altering the manner of the intestinal absorption of fat. Their experiments showed that choline probably does *not* alter the manner in which fat is absorbed by the intestinal villi. The results of this work are to be published shortly in *Nature*. In addition, Mr. Tasker has studied other aspects of the fate of fat reaching the intestine. These experiments are still in progress.

In the sub-department of Cellular Physiology work on various research projects has been carried out under the direction of Professor B. Mendel. Dr. Mendel and Dr. Rosemary Hawkins, continuing their investigations on the significance of the two types of cholinesterases in the hydrolysis of acetylcholine *in vivo* have been successful in finding a compound which, in certain concentrations, acts as a selective inhibitor of the true cholinesterase. When this inhibitor, a prostigmine analogue (Hoffmann-La Roche Nu-1250), is injected into rats, symptoms indicative of acetylcholine accumulation appear in spite of the undiminished activity of the pseudo-cholinesterase. From these experiments it can be concluded that the pseudo-cholinesterase is not only not essential for the hydrolysis of acetylcholine *in vivo,* but also is incapable of assuming even an auxiliary role in this process when the activity of the true cholinesterase is impaired.

Dr. Mendel and Mr. David Myers have been engaged in attempting to purify the true cholinesterase of brain. The main difficulty—the insolubility of the enzyme—has been overcome and fractionation of the aqueous enzyme solutions now obtained is progressing favourably.

Continuing their work on the investigation of factors influencing the level of pseudo-cholinesterase activity in the plasma, Dr. Hawkins and Miss M. Nishikawara have found that the hypophysis is not an essential link in the reaction whereby the inverse relationship between the level of thyroid function and plasma pseudo-cholinesterase activity is established. They have also found that dinitrophenol, a drug which like thyroxine increases basal metabolic rate, does not bring about a depression in plasma pseudo-cholinesterase activity. Experiments have shown that the ingestion of diets high in cholesterol exert no protective action against the depressing effect of thyroxine on the level of plasma pseudo-cholinesterase. On the contrary, the consumption of such diets leads of itself to a depression of the level of the enzyme. On the other hand, the ingestion of a diet low in lipotropic factors was found to result in a highly significant rise in plasma pseudo-cholinesterase. Further experiments are necessary to elucidate the mechanism whereby this elevation is produced.

Through the kindness of Professor W. R. Campbell, of the Department of Medicine, Miss Nishikawara has been able to obtain blood samples from thyrotoxic patients and to follow the level of pseudo-cholinesterase in their plasma during treatment and before and after thyroidectomy. In collaboration with Dr. J. Sinclair and Professor J. A. Dauphinee, of the Department of Pathological Chemistry, Dr. Hawkins has continued the investigation of changes in the level of cholinesterases in the plasma of patients with hepatic diseases. It has been found that pseudo-cholinesterase activity falls markedly with onset of hepatic insufficiency.

Dr. Mendel, Mr. Myers and Miss H. Christie have continued their investigation of the changes in the level of common esterase in the plasma of tumour-bearing animals. They have found that a decrease in the level of plasma common esterase is accompanied by a marked concentration of common esterase in the tumour.

A new method for the determination of blood sugar has been evolved by Dr. Mendel and Dr. P. L. Hoogland. This method is based not on the reducing power of glucose but on a colour reaction which glucose gives upon heating with sulphuric acid.

The amino acid composition of the liver proteins of starved rats and of rats bearing sarcomata has been investigated by Dr. Hoogland, Miss M. J. Thornton and Miss Christie. This work was preliminary to the study of possible changes in the composition of proteins of liver cells during their transition from normalcy to malignancy. It has been demonstrated that neither starvation nor the presence of a tumour *per se* affects the relative amounts of amino acids of the proteins in the liver. An analysis of the amino acid composition of the proteins of sarcomata in various species has also been carried out.

In the sub-department of Synthetic Chemistry, under the direction of Professor E. Baer, the synthesis of natural compounds of physiological significance has been continued. Dr. M. Kates developed a generally applicable method for the synthesis of fully saturated lecithins of definitely known constitution and configuration. An investigation of the chemical hydrolysis of the synthetic lecithins with regard to the liberation of choline and fatty acids, and the final composition of the glycerophosphoric acid mixtures was undertaken. Preliminary results of this investigation indicate that during the chemical hydrolysis migrations take place, similar to those observed during the chemical hydrolysis of L-α-glycerylphosphorylcholine. Hence it can now be definitely stated that all procedures for the elucidation of the constitution and configuration of naturally occurring lecithins which are based on chemical hydrolysis are misleading and should be replaced by enzymatic procedures.

Mr. A. G. Newcombe has synthesized several triglycerides, such as stearoyl-α, β-dimesyl glycerol, distearoyl-α-mesyl glycerol, and the corresponding palmitoyl compounds in both racemic and optically active forms. Because of the lyophilic nature of these compounds and an expected bacteriostatic action of the mesyl group contained therein, the chemotherapeutic properties of these compounds, especially with regard to tuberculosis, will be investigated.

Experiments by Dr. Baer on the synthesis of the enantiomeric forms of the fully saturated α-phosphatidic acids are in progress. Dr. Baer has also developed a new synthesis for enol-pyruvic acid phosphoric acid, an intermediary compound of carbohydrate metabolism.

Dr. T. F. West and Dr. Baer have studied the reaction of lead tetra-acetate on cinerolone, dihydrocinerolone and tetrahydropyrethrolone. The results, when considered with the evidence adduced by other workers in this field, provide strong support for a 1:3 ketol structure in both dihydrocinerolone and tetrahydropyrethrolone.

Professor W. R. Franks' group has continued various cancer studies. The investigation of the influence on carcinogenesis of the hormonal factor influencing metamorphosis in insecta has been carried forward with the assistance of Mr. M. R. Sutton, and although no final conclusions are yet justified, the material appears to delay the onset of cancer production from chemicals. Whether or not the effect of the bromine-containing metamorphosing factor is independent of the known effect of some aromatic bromine compounds remains to be seen. Isolation of various cytological fractions of cancer cells has been carried out with Mr. Sutton and these are at present on test in animals for cancer inducing action.

Miss J. Manser has been carrying out similar studies with Rous sarcoma where a fraction growing in the cytoplasm (virus) is known to be the causative agent for the tumour. These elements are being purified and collected in sufficient quantity to study more closely their nature, and physiological and immunological behaviour.

Absorption of the tumour itself following irradiation has been shown to give a marked degree of immunity to surviving birds and mammals and Dr. K. A. Brown has been studying the intimate nature of this means of immunization particularly in relation to spontaneous tumours. With this method over thirty per cent of animals can be immunized against experimentally induced tumours. The immunity obtained is highly specific for the type of tumour in question.

The modification of chemicals causing cancer to produce substances that might be used to counteract carcinogenesis has been continued. New compounds have been

conjugated from protein to form antigens whose immunizing activity is under test. In addition, various other derivatives which might prove active have been prepared with Mr. A. Rodgman. These involve chiefly easily oxidizable radicals. In this work, the carcinogen chemical nucleus is being used as a vehicle to reach the vulnerable site in the cell concerned with the malignant change.

With Mr. G. A. Meek, the influence of irradiation of wave lengths similar to that of known infective viruses is being studied biologically. These radiations fall within the range between x-rays and the ultraviolet.

The influence of ionizing background radiation on cancer production has been studied particularly in irradiation free laboratories provided half a mile underground at Schumacher, Ontario, through the kindness of McIntyre-Porcupine Mines Limited. A similar laboratory on the same level underground but with a background radiation similar to that on the surface has also been provided and is being used for control experiments. Spontaneous, genetic and virus cancer are being studied under these various conditions, as well as cancer induced by chemicals.

These investigations are made possible by grants provided by the National Cancer Institute of Canada and the Ontario Cancer Treatment and Research Foundation.

In co-operation with Dr. A. W. Farmer, of the Department of Surgery, Hospital for Sick Children, the study of means of preventing adhesions in tendons following injury has been continued. In particular, the use of silicone lubricants has been studied and although preliminary results have been promising, the safety of the procedure cannot be determined until long term experiments on tissue reaction to silicones have been completed. This work is being carried out with a grant in aid from the National Research Council.

Certain aspects of the metabolic and anatomical effects of repeated, subcutaneous injections of large amounts of epinephrine have been investigated by Dr. D. J. M. Adams and Dr. Fraser, in a series of normal dogs. These experiments failed to produce, after as long a period as three months, a sustained hyperglycaemia or hypertension. There did result varying degrees of adrenal cortical hyperplasia and of renal arteriolar sclerosis. Further studies by Drs. Adams and Fraser on the hypophysectomized, adrenalectomized mouse have indicated that this preparation is sensitive to extremely small amounts of insulin. However, they have been unable to demonstrate the presence of insulin in normal blood by use of these animals. Dr. Fraser has explored other possibilities for the assay of small amounts of insulin. Dr. Adams has studied the hyperglycaemia produced by injections of uric acid.

In collaboration with Dr. Markowitz and Dr. A. Rappaport, Drs. Colwell, Vuylsteke and Fraser are at present attempting to further elucidate the pathological and metabolic alterations occurring as a result of ligation of the hepatic artery in dogs.

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